The 9th Asian Conference on Fixed Point Theory and Optimization 2016

“Advances in fixed point theory towards real world optimization problems”

MAY 18 - 20, 2016

Faculty of Science, Fundamental Science Laboratory Bldg.

King Mongkut’s University of Technology Thonburi, Bangkok,

Organizers:

Sponsors:

Contract: Department of Mathematics,
Facility of Science, King Mongkut’s University of Technology Thonburi
126 Prachauthit Road, Bangmod, Thung Khru Bangkok, Thailand 10140
Tel: +66-(0)2-470-8994
Email: acfpto2016@kmutt.ac.th
URL : http://acfpto2016.kmutt.ac.th
FB: https://www.facebook.com/acfpto2016/
Message from the President of King Mongkut’s University of Technology Thonburi

I am very pleased and honored to welcome you to the 9th Asian Conference on Fixed Point Theory and Optimization 2016 (ACFPTO2016) with an interesting title “Advances in fixed point theory towards real world optimization problems” which King Mongkut’s University of Technology Thonburi proudly hosts the event. This is the tradition of the fixed point theory and optimization meetings in Thailand and remarks our special occasion of celebrating the 40th anniversary of Department of Mathematics and the 56th anniversary of King Mongkut’s University of Technology Thonburi.

Not only is this conference setting a stage to promote new developments, ideas and methods in dynamic field of mathematics from academics and researchers around the world, but it also provides a platform to build a network of researchers in both theoretical and applied mathematics. The progress in the subject is indeed vital as it plays an important role in all areas of research. In this conference, there will be invited talks and oral presentations. I believe that the exchange of ideas during the conference will indeed make connections fit for the theme of the conference. I would like to take this opportunity to express my gratitude to the organizers, committees and all who make this possible. I wish to sincerely thank all honorable speakers who have helped in the preparation and organizing the conference from the start and they are here with us to see it through, despite being occupied with their other obligations. I would like to thank our sponsors for their generosity and interest in this conference.

I wish the conference to be a great success and hope that you will find it fruitful with exciting new developments, ideas and methods for research in theoretical and applied mathematics. I declare the official opening of ACFPTO2016 and hope you have a pleasant and enjoyable time in Bangkok and our hospitality from King Mongkut’s University of Technology Thonburi throughout this conference.

Associate Professor Dr. Sakarindr Bhumiratana
President of King Mongkut’s University of Technology Thonburi
On behalf of Faculty of Science, King Mongkut’s University of Technology Thonburi (KMUTT), it give me a great pleasure to welcome each and every one of you to "The 9th Asian Conference on Fixed Point Theory and Optimization 2016 (ACFPTO2016)". It is a great honor for Department of Mathematics, Faculty of Science, King Mongkut’s University of Technology Thonburi to host this remarkable international conference as an integral part of our celebrating activities to commemorate the 40th year of Department of Mathematics and the 56th anniversary of KMUTT. Over the past years, the Department of Mathematics has been focused on committing excellent teaching and research in the area of mathematics, statistics and computer science based on international standard.

In this event, we are fortunate to bring together leading experts and researchers in fixed point theory and optimization and also to assess new developments, ideas and methods which are important on applications in related areas, as well as other sciences, such as the natural sciences, health science, epidemiology, economics and engineering.

Thank everyone for being here to contribute, to discuss, and to share research and new ideas, we will have the opportunity to gain insightful knowledge about Fixed Point Theory and Optimization research projects. Through the interaction, we expect that ACFPTO2016 may provide opportunities for further networking and development of science and technology.

Assistant Professor Dr. Woranuch Kerdsinchai
Dean of Faculty of Science, King Mongkut’s University of Technology Thonburi
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keynote and Invited Speakers</td>
<td>i</td>
</tr>
<tr>
<td>Committees</td>
<td>iv</td>
</tr>
<tr>
<td>Conference Program</td>
<td>vi</td>
</tr>
<tr>
<td>Parallel Sessions</td>
<td>vii</td>
</tr>
<tr>
<td>Abstracts of Keynote Speakers</td>
<td>1</td>
</tr>
<tr>
<td>Abstracts of Invited Speakers</td>
<td>9</td>
</tr>
<tr>
<td>Abstracts of Oral Presenters</td>
<td>24</td>
</tr>
<tr>
<td>Index</td>
<td>127</td>
</tr>
</tbody>
</table>
Keynote and Invited Speakers

Keynote Speakers

Wataru Takahashi

Wataru Takahashi is one of the most influential mathematician today, especially for those who work in the area around fixed point theory and related variational problems. He is now a professor at Keio University, Japan, and at National Sun Yat-sen University, Taiwan. He obtained his Bachelor from Yokohama National University, and his master as well as PhD degrees from Tokyo Institute of Technology, where he later spent years for his dedication to mathematics. He has contributed through his life the useful novel ideas and concepts in fixed point theory. He has published more than 300 research articles and almost 20 books in international journals and publishers, and he has been cited more than 4,000 times. He also serves as an editor of several reputed journals worldwide.

Sompong Dhompongsa

Sompong Dhompongsa is a leading professor of mathematics in Thailand. He is now working at Department of Mathematics, Chiang Mai University, Thailand. He finished both his BSc and MEd in 1975 from Srinakarinworot University, Thailand, and obtained his MSc and PhD in 1978 and 1982, respectively, from University of Illinois at Urbana Champaign, USA. He is best known for his expertise in both probability theory and fixed point theory. He has win several awards nationally and internationally, which proved his virtuosity in his works. He has published his researches in several international journals. Also, he is listed in several editorial boards of leading journals in the world. He is also regarded as father of fixed point theory in Thailand.

Phan Quoc Khanh

Phan Quoc Khanh is a professor of Mathematics at the International University, Vietnam National University Hochiminh City (HCMIU) and also the vice president of the Vietnam Mathematical Society. He obtained his PhD as well as DSc degrees in 1978 and 1988, respectively, at the Institute of Mathematics, Polish Academy of Sciences. He was the founder-president of HCMIU. He is also the founder-head of Department of Optimization and System Theory at the University of Science of Hochiminh City, adjunct professor at the Federation University, Australia, vice president of the Mathematical Council of the National Foundation for Science and Technology Development, member of the Scientific Council of the Vietnam Institute for Advanced Study in Mathematics (VIASM) and the National Council for Mathematics Professorship. Now, he is an associate editor of a number of international mathematical journals.
Qamrul Hasan Ansari is a professor in the Department of Mathematics, Aligarh Muslim University, Aligarh, India. He was awarded his Master in 1985 and his PhD in 1988 from The Aligarh Muslim University, India. He has published more than 140 research papers in internationally repute journals. He is the associate editor of Journal of Optimization Theory and Applications and Journal of Inequalities and Applications. He has acted as a guest editor of several internationally repute journals, namely, Positivity, Journal of Global Optimization, Applicable Analysis, Journal of Fixed Point Theory, etc. He is listed in the top cited 1200 mathematicians of the world. He is a regular visitor of several universities around the world.

Yeol Je Cho is one of the most well-known mathematician in Korea. He finishes his BS, MS, and PhD at Busan National University in 1976, 1979, and 1984, respectively. He did his post-doctoral in USA during 1987-1988. Now, he is a professor in mathematics at the Department of Mathematics Education and the RINS, Gyeongsang National University, South Korea. He is an expert in several areas in nonlinear analysis including fixed point theory, variational analysis, optimization, and functional equations. By his outstanding knowledge, he was elected as a member of several renowned societies, and had won many award around the world. He is in editorial boards of various international journals, and has published a great number of research papers and books. He is also listed as one of the most cited authors in pure mathematics.

Tamaki Tanaka is a professor at Niigata University, Japan, where he had actually obtained his degrees from Bachelor through PhD. His research Expertise is convex analysis, nonlinear analysis, game theory, vector optimization and set-valued analysis. He has developed a framework of vector-valued minimax problems and proved saddle-point existence theorems and several types of minimax inequality results. Moreover, he has introduced a framework of multicriteria game whose payoff takes its values in a vector space, and by using computational programs he has made such problems more visualizable. Recently, he and his group have developed nonlinear scalarization methods for set-valued maps, and proved inherited properties on convexity and semi-continuity. Also, his group is concerned with Operations Research including vector optimization and global optimization.
Invited Speakers

Ryszard Pluciennik, Poznan University of Technology, Poland.

Suthep Suantai, Chiang Mai University, Thailand.

Somyot Plubtieng, Naresuan University, Thailand.

Jong Kyu Kim, Kyungnam University, South Korea.

Yasunori Kimura, Toho University, Japan.

Michel De Lara, Université Paris-Est, France.

Dhananjay Gopal, S. V. National Institute of Technology, India.

Satit Saejung, Khon kaen University, Thailand.

Ali Farajzadeh, Razi University, Kermanshah, Iran.

Lam Quoc Anh, Can Tho University, Vietnam.

Rabian Wangkeeree, Naresuan University, Thailand.

Fumiaki Kohsaka, Tokai University, Japan.

Sang-Eon Han, Chonbuk National University, South Korea.
Committees

Scientific Committees

W. Takahashi, Tokyo Institute of Technology & Keio University, Japan.
S. Dhompongsa, Chiang Mai University, Thailand.
S. Plubtieng, Naresuan University, Thailand.
S. Suantai, Chiang Mai University, Thailand.
A. T. Lau, University of Alberta, Canada.

International Program Committees

W. Takahashi, Tokyo Institute of Technology & Keio University, Japan (Chair).
S. Dhompongsa, Chiang Mai University, Thailand (Co-Chair).
S. Plubtieng, Naresuan University, Thailand (Co-Chair).
S. Suantai, Chiang Mai University, Thailand (Co-Chair).
P. Kumam, King Mongkut’ts University of Technology Thonburi, Thailand (Secretariat).
T. Tanaka, Niigata University, Japan.
D.T. Luc, University of Avignon, France.
N. Petrot, Naresuan University, Thailand.
R.L. Sheu, National Cheng-Kung University, Tainan, Taiwan.
T.Q. Son, Saigon University, Vietnam.
R. Wangkeeree, Naresuan University, Thailand.
H.K. Xu, National Sun Yat-sen University, Taiwan.
J.C. Yao, Kaohsiung Medical University, Taiwan.
A. Kaewcharoen, Naresuan University, Thailand.
N. Khamsemanan, Thammasat University, Thailand.
B. Panyanak, Chiang Mai University, Thailand.
J. K. Kim, Kyungnam University, Korea.
A. Farajzadeh, Razi University, Kermanshah, Iran.

Organizing Committees

R. Wangkeeree, Naresuan University, Thailand.
N. Petrot, Naresuan University, Thailand.
A. Inchan, Uttaradit Rajabhat University, Thailand.
N. Khamsemanan, SIT, Thammasat University, Thailand.
J. Tariboon, King Mongkut’s University of Technology North Bangkok, Thailand.
B. Panyanak, Chiang Mai University, Thailand.
Local Organizing Committees at KMUTT

T. Jirasuksakun, King Mongkut’s University of Technology Thonburi, Thailand (Head of Mathematics Department).
K. Kumam, King Mongkut’s University of Technology Thonburi, Thailand.
K. Akkarajitsakul, King Mongkut’s University of Technology Thonburi, Thailand.
D. Thongtha, King Mongkut’s University of Technology Thonburi, Thailand.
T. Saleewong, King Mongkut’s University of Technology Thonburi, Thailand.
A. Sae-tang, King Mongkut’s University of Technology Thonburi, Thailand.
P. Sa-Ngiamsunthorn, King Mongkut’s University of Technology Thonburi, Thailand.
P. Phunchongharn, King Mongkut’s University of Technology Thonburi, Thailand.
C. Watchararuangwit, King Mongkut’s University of Technology Thonburi, Thailand.
P. Wankowit, King Mongkut’s University of Technology Thonburi, Thailand.
S. Yookong, King Mongkut’s University of Technology Thonburi, Thailand.
W. Leawlien, King Mongkut’s University of Technology Thonburi, Thailand.
A. Wisitsorrasak, King Mongkut’s University of Technology Thonburi, Thailand.
C. La-o-vorakiat, King Mongkut’s University of Technology Thonburi, Thailand.
T. Thanatphanit, King Mongkut’s University of Technology Thonburi, Thailand.

Local Coordinator

P. Kumam, King Mongkut’s University of Technology Thonburi, Thailand.

(The Secretariat Conference of ACFPTO 2016)
The 9th Asian Conference on Fixed Point Theory and Optimization 2016  
on 18-20 MAY 2016  
Faculty of Science, KMUTT, Bangkok, Thailand

<table>
<thead>
<tr>
<th>Time</th>
<th>Wednesday, May 18, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>08.00 - 08.30</td>
<td>Registration (Area front Room 600 Fundamental Science Laboratory Bldg)</td>
</tr>
<tr>
<td>08.30 - 09.00</td>
<td>Opening Ceremony (Room 600 Fundamental Science Laboratory Bldg)</td>
</tr>
<tr>
<td></td>
<td>(Conference Report: Asst. Prof. Dr. Woranuch Kerdsinchai, Dean of Faculty of Science, KMUTT)</td>
</tr>
<tr>
<td></td>
<td>(Welcome Speech and Opening remark: Assoc. Prof. Dr. Sakarindr Bhumiratana, President of King Mongkut’s University of Technology Thonburi, KMUTT)</td>
</tr>
<tr>
<td>09.00 - 09.45</td>
<td>Plenary lecture: Prof. Dr. Wataru Takahashi, Japan (Prof. Dr. Sompong Dhompongs, Chair)</td>
</tr>
<tr>
<td>09.45 - 10.00</td>
<td>Coffee break</td>
</tr>
<tr>
<td>10.00 - 10.30</td>
<td>Invited Speaker</td>
</tr>
<tr>
<td></td>
<td>Prof. Dr. Suthep Suantai, Thailand (A. Farajzadheh, Chair)</td>
</tr>
<tr>
<td></td>
<td>Prof. Dr. J.K.Kim, Korea (G. Gopal, Chair)</td>
</tr>
<tr>
<td></td>
<td>Prof. Dr. Somyot Plubtieng, Thailand (Y. J. Cho, Chair)</td>
</tr>
<tr>
<td>10.30 - 12.00</td>
<td>Plenary lecture: Prof. Y.J. Cho, Korea (L.Q. Anh, Chair)</td>
</tr>
<tr>
<td>12.00 - 13.00</td>
<td>Lunch</td>
</tr>
<tr>
<td>13.00 - 14.00</td>
<td>Coffee break</td>
</tr>
<tr>
<td>14.00 - 16.00</td>
<td>Invited Speaker</td>
</tr>
<tr>
<td></td>
<td>Prof. Dr. Ryszard Pluciennik, Poland (S. Suantai, Chair)</td>
</tr>
<tr>
<td>16.00 - 16.15</td>
<td>Oral Presentation (Parallel Sessions)</td>
</tr>
<tr>
<td>16.15 - 18.00</td>
<td>Oral Presentation (Parallel Sessions)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Thursday, May 19, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.00 - 09.45</td>
<td>Plenary lecture: Prof. Dr. Phan Quoc Khanh, Vietnam (Prof. Dr. Tamaki Tanaka Chair)</td>
</tr>
<tr>
<td>09.45 – 10.15</td>
<td>Invited Speaker</td>
</tr>
<tr>
<td></td>
<td>Asst. Prof. Dr. D.Gopal, India (W. Sintunavarat, Chair)</td>
</tr>
<tr>
<td></td>
<td>Prof. Dr. A. Farajzadeh, Iran (A. Kaewcharoen, Chair)</td>
</tr>
<tr>
<td></td>
<td>Assoc. Prof. Dr. Fumiaki Kohsaka, Japan (N. Petrot, Chair)</td>
</tr>
<tr>
<td>10.15 - 10.30</td>
<td>Coffee break</td>
</tr>
<tr>
<td>10.30 - 12.00</td>
<td>Oral Presentation (Parallel Sessions)</td>
</tr>
<tr>
<td>12.00 - 13.00</td>
<td>Lunch</td>
</tr>
<tr>
<td>13.00 - 14.30</td>
<td>Plenary lecture: Prof. Dr. Tamaki Tanaka, Japan (Prof. Dr. Qamrul Hassan Ansari, Chair)</td>
</tr>
<tr>
<td>14.15 - 16.20</td>
<td>Oral Presentation (Parallel Sessions)</td>
</tr>
<tr>
<td>16.20 - 16.35</td>
<td>Coffee break</td>
</tr>
<tr>
<td>16.30 - 17.30</td>
<td>Oral Presentation (Parallel Sessions)</td>
</tr>
<tr>
<td>17.35 - 18.00</td>
<td>Going to TONGTARA Riverview Hotel (Charoen Krung)</td>
</tr>
<tr>
<td>18.00 - 21.00</td>
<td>Banquet: at TONGTARA Riverview Hotel (Charoen Krung)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Friday, May 20, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.00 - 09.45</td>
<td>Plenary lecture: Prof. Dr. Qamrul Hassan Ansari, India (Prof. Y.J. Cho, Chair)</td>
</tr>
<tr>
<td>09.45 – 10.15</td>
<td>Invited Speaker</td>
</tr>
<tr>
<td></td>
<td>Assoc. Prof. Dr. Satit Saejung, Thailand (K. Nonlaopon, Chair)</td>
</tr>
<tr>
<td></td>
<td>Prof. Dr. M.De Lara, France (C. La-o-vorakiat, Chair)</td>
</tr>
<tr>
<td></td>
<td>Professor Sang-Eon Han, Korea (S. Phiangsungnoen, Chair)</td>
</tr>
<tr>
<td>10.15 - 10.30</td>
<td>Coffee break</td>
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<tr>
<td>10.30 - 12.00</td>
<td>Plenary lecture:</td>
</tr>
<tr>
<td></td>
<td>Prof. Dr. Sompong Dhompongs, Chiang Mai University, Thailand</td>
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<tr>
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<td>Prof. Dr. Somyot Plubtieng, Naresuan University, Thailand (Chair)</td>
</tr>
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<td></td>
<td>Prof. Dr. Suthep Suantai, Chiang Mai University, Thailand (Co-Chair)</td>
</tr>
<tr>
<td>11.30 - 12.00</td>
<td>Closing Ceremony: All Scientific Committees, Room 600 Fundamental Science Laboratory Building</td>
</tr>
<tr>
<td>12.00 - 13.00</td>
<td>Lunch</td>
</tr>
<tr>
<td>13.00</td>
<td>Excursion</td>
</tr>
</tbody>
</table>
**Oral Presentation (Parallel Sessions)**

**18 May 2016 - I**

**Time: 10.30 am. - 12.00 am.**

<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A: Nonlinear Functional Analysis</th>
<th>Section B: Computational and Optimization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Room:</strong> Basement Learning Space</td>
<td><strong>Room:</strong> Sci-Connect</td>
<td><strong>Chair:</strong> J.K. Kim</td>
</tr>
<tr>
<td><strong>Co-Chair:</strong> B. Panyanak</td>
<td><strong>Co-Chair:</strong> K. Nammanee</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Speaker ID</th>
<th>Speaker Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10.30 - 10.45 am.</strong></td>
<td>An iterative method for triple-hierarchical problems</td>
<td>ID 070</td>
<td>Thanyarat Jitpeera</td>
</tr>
<tr>
<td></td>
<td>Variational convergence of bifunctions on nonrectangular domains and applications</td>
<td>ID 029</td>
<td>Huynh Thi Hong Diem</td>
</tr>
<tr>
<td><strong>10.45 - 11.00 am.</strong></td>
<td>Convergence theorem for solving the combination of equilibrium problems and fixed point problems in Hilbert spaces</td>
<td>ID 076</td>
<td>Sarawut Suwannaut</td>
</tr>
<tr>
<td></td>
<td>Stability Analysis for Lexicographic Vector Equilibrium Problem</td>
<td>ID 067</td>
<td>Thanatporn Bantaojai</td>
</tr>
<tr>
<td><strong>11.00 - 11.15 am.</strong></td>
<td>Attractive points, acute point and fixed point properties for nonlinear mappings</td>
<td>ID 109</td>
<td>Sachiko Atsushiba</td>
</tr>
<tr>
<td></td>
<td>On vector optimization problems with geometric framework</td>
<td>ID 068</td>
<td>Ariana Pitea</td>
</tr>
<tr>
<td><strong>11.15 - 11.30 am.</strong></td>
<td>Some convergence results for SKC mapping in hyperbolic spaces</td>
<td>ID 164</td>
<td>Renu Chugh</td>
</tr>
<tr>
<td></td>
<td>Weak Pareto-optimality for multi-objective optimization involving tangentially convex functions</td>
<td>ID 096</td>
<td>Nithirat Sisarat</td>
</tr>
<tr>
<td><strong>11.30 - 11.45 am.</strong></td>
<td>An iterative approximation scheme for solving a split generalized equilibrium, variational inequalities and fixed point problems</td>
<td>ID 169</td>
<td>Kanokwan Sitthithakerngkit</td>
</tr>
<tr>
<td></td>
<td>On penalty method for lexicographic vector equilibrium problems</td>
<td>ID 150</td>
<td>Tran Quoc Duy</td>
</tr>
<tr>
<td><strong>11.45 - 12.00 am.</strong></td>
<td>A new hybrid iterative algorithm for numerical reckoning fixed points of Suzuki's generalized nonexpansive mappings</td>
<td>ID 170</td>
<td>Wutiphol Sintunavarat</td>
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<tr>
<td></td>
<td>Existence results for new extended vector variational-like inequality and equilibrium problems</td>
<td>ID 090</td>
<td>Boonyarit Ngeonkam</td>
</tr>
</tbody>
</table>

ACFPTO 2016 | May 18-20,2016 | KMUTT | Bangkok, Thailand
### Oral Presentation (Parallel Sessions)
18 May 2016 - II
*Time*: 02.00 pm. - 04.00 pm.

<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A : Nonlinear Functional Analysis</th>
<th>Section B : Computational and Optimization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Room</strong>: Basement Learning Space</td>
<td><strong>Room</strong>: Sci-Connect</td>
<td><strong>Room</strong>: Sci-Connect</td>
</tr>
<tr>
<td><strong>Chair</strong>: Y.J. Cho</td>
<td><strong>Chair</strong>: A. Farajzadeh</td>
<td><strong>Chair</strong>: A. Farajzadeh</td>
</tr>
<tr>
<td><strong>Co-Chair</strong>: C. Klin-eam</td>
<td><strong>Co-Chair</strong>: K. Ungchitrakool</td>
<td><strong>Co-Chair</strong>: K. Ungchitrakool</td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Oral Presentation</th>
<th>Section A</th>
<th>Section B</th>
</tr>
</thead>
<tbody>
<tr>
<td>02.00 - 02.15 pm.</td>
<td>Endpoints of multi-valued nonexpansive mappings in geodesic spaces</td>
<td>A general iterative method for solving convex optimization problems of the sum of two convex functions</td>
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<tr>
<td><strong>ID</strong>: 010</td>
<td><em>Bancha Panyanak</em></td>
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<tr>
<td>02.15 - 02.30 pm.</td>
<td>Convergence theorems in CAT(0) space and an application</td>
<td>The Prediction of Drought Using Correlation between Temperature and Rainfall</td>
<td></td>
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<tr>
<td><strong>ID</strong>: 011</td>
<td><em>Javid Ali</em></td>
<td></td>
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</tr>
<tr>
<td>02.30 - 02.45 pm.</td>
<td>Fixed point theorems for fundamentally nonexpansive mappings in CAT(k) spaces</td>
<td>Sequential optimality conditions for fractional convex optimization problem</td>
<td></td>
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<tr>
<td><strong>ID</strong>: 013</td>
<td><em>Bancha Nanjaras</em></td>
<td></td>
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<tr>
<td>02.45 - 03.00 pm.</td>
<td>Fixed point and convergence theorems for Suzuki type Z-contraction mappings in CAT(0) spaces</td>
<td>Barrier method for convex optimization problem without regularity of constraint functions</td>
<td></td>
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<tr>
<td><strong>ID</strong>: 059</td>
<td><em>Nuttapol Pakkaranang</em></td>
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<tr>
<td>03.00 - 03.15 pm.</td>
<td>Browder’s Convergence Theorem in CAT(0) Spaces Endowed with Graph</td>
<td>On Locating-Chromatic Number of a Complete n-ary Tree of Depth 1, 2 and 3</td>
<td></td>
</tr>
<tr>
<td><strong>ID</strong>: 110</td>
<td><em>Buris Tongnoi</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Locations**:
- **Section A**: Nonlinear Functional Analysis
  - Room: Basement Learning Space
  - Chair: Y.J. Cho
  - Co-Chair: C. Klin-eam
- **Section B**: Computational and Optimization
  - Room: Sci-Connect
  - Chair: A. Farajzadeh
  - Co-Chair: K. Ungchitrakool

**Dates and Times**:
- 18 May 2016 - II
- Time: 02.00 pm. - 04.00 pm.

**Presenters**:
- **ID**: 010 Bancha Panyanak
- **ID**: 011 Javid Ali
- **ID**: 013 Bancha Nanjaras
- **ID**: 059 Nuttopak Phakaranang
- **ID**: 110 Buris Tongnoi
- **ID**: 084 Kan Buranakorn
- **ID**: 093 Chalermchai Puripat
- **ID**: 099 Thanatchaporn Sirichunwijit
- **ID**: 116 Porntip Promsinchai
- **ID**: 128 Des Weltyanti

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ACFPTO 2016 | May 18-20,2016 | KMUTT | Bangkok, Thailand
<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A : Nonlinear Functional Analysis</th>
<th>Section B : Computational and Optimization</th>
</tr>
</thead>
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<tr>
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<td>Room : Basement Learning Space</td>
<td>Room : Sci-Connect</td>
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<tr>
<td>03.15 - 03.30 pm.</td>
<td>Existence and convergence of fixed points for a strict pseudo-contraction in CAT(0) spaces</td>
<td>Narongrit Puturong</td>
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<td></td>
<td>Adaptive optimal control for a bilinear model in cancer chemotherapy</td>
<td>Solikhatun</td>
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<td>03.30 - 03.45 pm.</td>
<td>A convergence theorem for a finite family of multivalued k-strictly Pseudononspeading mappings in R-trees</td>
<td>Khanitin Samanmit</td>
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<td>Design linear state feedback controller for bilinear system using hybrid genetic algorithm-particles swarm optimization</td>
<td>Taufan Mahardhika</td>
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<td>03.45 - 04.00 pm.</td>
<td>Anti-Disturbance Inverse Optimal Control for Spacecraft Position and Attitude Maneuvers with Input Saturation</td>
<td>Chutiphon Pukdeboon</td>
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<td>Time</td>
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<td>04.15 - 04.30 pm.</td>
<td>Some fixed point theorems for multivalued F-fuzzy contraction mappings in fuzzy metric spaces</td>
<td>Room: Basement Learning Space Chair: D. Gopal Co-Chair: N. Wairojjana</td>
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<td></td>
<td>ID 006 Darunee Hunwisai</td>
<td>ID 066 Jiraprapa Munkong</td>
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<td>04.30 - 04.45 pm.</td>
<td>Best proximity point multivalued cyclic F-contraction</td>
<td>Room: Sci-Connect Chair: A. Kaewcharoen Co-Chair: T. Jitpeera</td>
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<td>ID 062 Kanchha Bhai Manandhar</td>
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<td>04.45 - 05.00 pm.</td>
<td>$\text{Q}_\phi$-fixed point theorems for generalized $F, q$-contraction mappings in metric spaces with applications</td>
<td>Room: SCL 213 - 214 Chair: J. Tariboon Co-Chair: T. Mahardhika</td>
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<tr>
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<td>ID 051 Pathaithep Kumrod</td>
<td>ID 063 Laddawan Aiemsomboon</td>
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<td>05.00 - 05.15 pm.</td>
<td>Fixed point results for $F_n$ contractions and solving the nonlinear matrix equation</td>
<td>Room: SCL 213 - 214 Chair: J. Tariboon Co-Chair: T. Mahardhika</td>
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<td>ID 083 Warut Saksirikan</td>
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<tr>
<td></td>
<td>Some common fixed point theorems for generalized cyclic multi-valued contractive operators in complete metric spaces</td>
<td>Room: SCL 213 - 214 Chair: J. Tariboon Co-Chair: T. Mahardhika</td>
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<td>Variational Inequalities for L-fuzzy Mappings</td>
<td>Room: SCL 213 - 214 Chair: J. Tariboon Co-Chair: T. Mahardhika</td>
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ACFPTO 2016 | May 18-20,2016 | KMUTT | Bangkok, Thailand
<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A: Nonlinear Functional Analysis</th>
<th>Section B: Computational and Optimization</th>
<th>Section C: Other Related Topic</th>
</tr>
</thead>
<tbody>
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<td>Room: Basement Learning Space</td>
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<td>Room: SCL 213 - 214</td>
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### 05.15 - 05.30 pm.

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<td>016</td>
<td>Chaowalit Panthong</td>
<td>Some coincidence points for multi-valued F-weak contractions on complete metric spaces endowed with a graph</td>
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<td>148</td>
<td>Areerat Arunchai</td>
<td>A generalization of Ekeland’s ( \mathcal{E} )-variational principle for ( T )-distance</td>
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<td>118</td>
<td>Supak Phiangsungnoen</td>
<td>Fixed point theorems for generalized fuzzy contractive mappings with altering distance in fuzzy metric spaces</td>
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### 05.30 - 05.45 pm.

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<tr>
<td>064</td>
<td>Dilip Jain</td>
<td>New fixed point theorems of multivalued F-contractions in modular metric spaces and its application to non-linear integral equations</td>
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<td>142</td>
<td>Deepesh Kumar Patel</td>
<td>Fixed points and periodic points of ( T )-type F-contractive mappings</td>
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<tr>
<td>120</td>
<td>Khusnul Novianingsih</td>
<td>Flight Re-timing Models to Improve the Robustness of Aircraft Routings</td>
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### Oral Presentation (Parallel Sessions)

#### 19 May 2016 - I

**Time:** 10.30 am. - 12.00 am.

<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A : Nonlinear Functional Analysis</th>
<th>Section B : Computational and Optimization</th>
<th>Section C : Other Related Topic</th>
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<td>Room</td>
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<td>W. Sintunavarat</td>
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<td>K. Jha</td>
<td>P. Phuangphoo</td>
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<tr>
<td><strong>10.30 - 10.45 am.</strong></td>
<td><strong>Random fixed point theorem for a random Hardy-Rogers mappings</strong></td>
<td><strong>Modified forward-backward splitting methods for accretive operators in Banach spaces</strong></td>
<td><strong>Equilibrium problems in Hadamard manifolds</strong></td>
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<td>ID 005</td>
<td>Plerm Saipara</td>
<td>ID 027</td>
<td>ID 036 Parin Chaipunya</td>
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<td>ID 032</td>
<td>Chirasak Mongkolkeha</td>
<td>ID 080</td>
<td>ID 075 Jittiporn Tangkhawiwetkul</td>
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<tr>
<td><strong>10.45 - 11.00 am.</strong></td>
<td><strong>Fixed point theorems for simulation functions in b-metric spaces via the wt-distance</strong></td>
<td><strong>Numerical simulation of an air pollution model on industrial areas by considering the influence of multiple point sources</strong></td>
<td><strong>Sensitivity analysis of the quasi variational inequality problem on uniformly prox regular sets</strong></td>
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<td>ID 031</td>
<td>Praveen Kumar Sharma</td>
<td>ID 077</td>
<td>ID 095 Panatda Boonman</td>
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<td>Wongvisarut Khuangsatung</td>
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<tr>
<td><strong>11.00 - 11.15 am.</strong></td>
<td><strong>A common fixed point theorem for six self maps in fuzzy metric spaces using implicit relation and property (CLRg)</strong></td>
<td><strong>Strong convergence theorems for the modified variational inclusion problems and various nonlinear mappings in Hilbert space</strong></td>
<td><strong>Painlevé-Kuratowski variational inclusion problems</strong></td>
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## Oral Presentation (Parallel Sessions)

### 19 May 2016 - I (Cont.)

**Time**: 10.30 am - 12.00 am.

<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A : Nonlinear Functional Analysis</th>
<th>Section B : Computational and Optimization</th>
<th>Section C : Other Related Topic</th>
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<td>K. Jha</td>
<td>Co-Chair : P. Phuangphoo</td>
<td>Co-Chair : L.Q. Anh</td>
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</table>

### 11.15 - 11.30 am.

**ID 041** Anita Tomar

**ID 069** Young-Ho Kim

**ID 115** Pakkapon Preechasilp

- On existence of coincidence and common fixed point of faintly compatible pair of maps
- Recent results to approximate solution of stochastic differential delay equations
- A note on continuity of solution set for vector equilibrium problems

### 11.30 - 11.45 am.

**ID 056** Wudthicai Onsod

**ID 082** Piyada Phosri

**ID 162** Tran Ngoc Tam

- Common fixed points for type (phi, psi)-weak contraction mapping in intuitionistic fuzzy metric spaces
- Numerical computation of a water-quality model with advection-diffusion-reaction equation using an upwind implicit scheme
- Stability for parametric primal and dual equilibrium problems

### 11.45 - 12.00 am.

**ID 065** Umesh Rajopadhyaya

**ID 111** Animesh Gupta

**ID 055** Jamnian Nantadilok

- A common fixed point theorem for sequence of mappings in semi-metric space with compatible mapping of type (E)
- Tripled PBVPS of nonlinear second order differential equations
- Best proximity point theorems for Suzuki type proximal contractive multi-maps

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ACFPTO 2016 | May 18-20,2016 | KMUTT | Bangkok, Thailand
### Oral Presentation (Parallel Sessions)

**19 May 2016 - II**

**Time:** 02.15 pm. - 03.45 pm.

<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A: Nonlinear Functional Analysis</th>
<th>Section B: Computational and Optimization</th>
<th>Section C: Other Related Topic</th>
</tr>
</thead>
<tbody>
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<td><strong>Room:</strong> Sci-Connect</td>
<td><strong>Room:</strong> SCL 213 - 214</td>
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<td><strong>Chair:</strong> I. Inchan</td>
<td><strong>Chair:</strong> T.Q. Son</td>
<td><strong>Chair:</strong> N. Petrot</td>
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<td><strong>Co-Chair:</strong> S. Phiangsungnoen</td>
<td><strong>Co-Chair:</strong> P. Preechasilp</td>
<td><strong>Co-Chair:</strong> C. Mongkolkeha</td>
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#### 02.15 - 02.30 pm.

- **ID 072** Kanhaiya Jha: A common fixed point theorem for subcompatible mappings in fuzzy metric space
- **ID 033** Nimit Nimana: Adaptive sub-gradient method for the split quasi-convex feasibility problems
- **ID 086** Cholatis Suanoom: On coupled-nonexpansive mappings

#### 02.30 - 02.45 pm.

- **ID 045** Somkiat Chaipornjareansri: Fixed point theorems for $F_W$-contractions in complete $S$-metric spaces
- **ID 037** Somayya Komal: A Best Proximity Point Theorem for Generalized Contraction in Complete Metric Spaces
- **ID 125** Choonkil Park: Fixed points and quadratic $\rho$-functional inequalities in Banach spaces

#### 02.45 - 03.00 pm.

- **ID 009** Pakeeta Sukprasert: Fixed point results for generalized $(\psi, \phi)$-contractive mappings in rectangular $b$-metric spaces
- **ID 038** Chayut Kongban: Best proximity point theorems for multivalued F-contractive mappings
- **ID 091** Nattanawan Piwmai: A new two-step fixed points iterative scheme for two asymptotically nonexpansive mappings

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**Section A:** Nonlinear Functional Analysis

**Section B:** Computational and Optimization

**Section C:** Other Related Topic

**Chair:** I. Inchan

**Co-Chair:** S. Phiangsungnoen

**Room:** Basement Learning Space

**Chair:** T.Q. Son

**Co-Chair:** P. Preechasilp

**Room:** Sci-Connect

**Chair:** N. Petrot

**Co-Chair:** C. Mongkolkeha

**Room:** SCL 213 - 214

**Chair:** I. Inchan

**Co-Chair:** T.Q. Son

**Chair:** N. Petrot

**Room:** SCL 213 - 214

**Chair:** I. Inchan

**Co-Chair:** T.Q. Son

**Chair:** N. Petrot

**Room:** SCL 213 - 214

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ACFPTO 2016 | May 18-20,2016 | KMUTT | Bangkok,Thailand
## Oral Presentation (Parallel Sessions)

### 19 May 2016 - II (Cont.)

**Time**: 02.15 pm. - 03.45 pm.

<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A : Nonlinear Functional Analysis</th>
<th>Section B : Computational and Optimization</th>
<th>Section C : Other Related Topic</th>
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<td><strong>Room</strong></td>
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<td>P. Preechasilp</td>
<td>C. Mongkolkeha</td>
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### 03.00 - 03.15 pm.
- **ID 008** Phumin Sumalai
- **ID 066** Kasamsuk Ungchittrakool
- **ID 092** Pongrus Phuangphoo

**New coupled fixed point results for F-contractive mappings in a metric space endowed with a graph and applications**

**A best proximity point theorem for generalized non-self Kannan and Chetterjea type mappings and Lipschitzian mappings in complete metric spaces**

**A Halpern iteration for system of equilibrium and variational inequality and fixed point problems of families of quasi -phi-asymptotically nonexpansive in Banach spaces**

### 03.15 - 03.30 pm.
- **ID 007** Chatuphol Khaofong
- **ID 135** Thidaporn Seangwattana
- **ID 133** Pongsakorn Sunthrayuth

**Multidimensional coincidence point theorems for \( \psi \) -weak contractions in partially ordered fuzzy metric spaces**

**The Borwein-Preiss variational principle for nonconvex countable systems of equilibrium problems**

**The resolvent operator techniques with perturbations for finding zeros of maximal monotone operator and fixed point problems in Hilbert spaces**

### 03.30 - 03.45 pm.
- **ID 113** Lokesh Budhia
- **ID 155** Chanoksuda Khantree
- **ID 028** Jitsupa Deepho

**Extensions of almost-F and F-Suzuki contractions with graph and some applications to fractional calculus**

**Sequential Optimality Conditions for Generalized Equilibrium Problems involving DC functions**

**An iterative approximation scheme for solving a split generalized equilibrium, variational inequalities and fixed point problems**
### Oral Presentation (Parallel Sessions)

**19 May 2016 - III**

**Time**: 04.00 pm. - 05.30 pm.

<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A: Nonlinear Functional Analysis</th>
<th>Section B: Computational and Optimization</th>
<th>Section C: Other Related Topic</th>
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<td><strong>Chair</strong>: P. Cholamjiak</td>
<td><strong>Chair</strong>: C. Labuschagne</td>
<td><strong>Chair</strong>: K. Nonlaopon</td>
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<td><strong>Co-Chair</strong>: J. Deepho</td>
<td><strong>Co-Chair</strong>: U. Witthayarat</td>
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<td>04.00 - 04.15 pm.</td>
<td>074</td>
<td>Tadchai Yuying</td>
<td>089</td>
<td>Prondanai Kaskasem</td>
<td>149</td>
<td>Jessada Tariboon</td>
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<tr>
<td><strong>Section A</strong>: Strong convergence theorems by hybrid and shrinking projection methods for sums of two monotone operators</td>
<td><strong>Section B</strong>: Some quadrupled best proximity point theorems in C*-algebra-valued metric spaces</td>
<td><strong>Section C</strong>: Impulsive quantum difference equations</td>
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<td>04.15 - 04.30 pm.</td>
<td>046</td>
<td>Anantachai Padcharoen</td>
<td>108</td>
<td>Yumnam Rohen</td>
<td>174</td>
<td>Le Minh Huy</td>
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<tr>
<td><strong>Section A</strong>: Some common minimum-norm fixed points of a finite family of (\alpha)-asymptotically quasi-non-expansive non-self mappings with applications</td>
<td><strong>Section B</strong>: Some quadrupled best proximity point theorems partially ordered metric spaces</td>
<td><strong>Section C</strong>: On the qualitative properties for solutions equilibrium problem involving Lorentz cone</td>
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<td>129</td>
<td>Preeyanuch Chuasuk</td>
<td>114</td>
<td>Phikul Sridarat</td>
<td>109</td>
<td>Sachiko Atsushiba</td>
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<tr>
<td><strong>Section A</strong>: An iterative process for a hybrid pair of generalized I-asymptotically non-expansive single-valued mapping and generalized non-expansive multi-valued mappings in Banach spaces</td>
<td><strong>Section B</strong>: Common fixed point theorems for multi-valued weak contractive mappings in metric spaces with graphs</td>
<td><strong>Section C</strong>: Attractive points, acute point and fixed point properties for nonlinear mappings</td>
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### Oral Presentation (Parallel Sessions)
**19 May 2016 - III (Cont.)**
**Time: 04.00 pm. - 05.30 pm.**

<table>
<thead>
<tr>
<th>Oral Presentation</th>
<th>Section A: Nonlinear Functional Analysis</th>
<th>Section B: Computational and Optimization</th>
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</tr>
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<th>Time</th>
<th>Session A</th>
<th>Session B</th>
<th>Session C</th>
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<tbody>
<tr>
<td>04.45 - 05.00 pm.</td>
<td>Fast Mann and CQ algorithms for a non-expansive mapping</td>
<td>Fixed point theorems of a new set-valued MT-contraction in b-metric spaces endowed with graphs and applications</td>
<td>Stability analysis on mathematical model of spreading the parasit of toxoplasma gondii from cat to congenital infection of pregnant mother have an impact on the fetus through the placenta with herbal therapy</td>
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<td>ID 078</td>
<td>Qiao-Li Dong</td>
<td>ID 117</td>
<td>Jukrapong Tiamme</td>
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| 05.00 - 05.15 pm. | Fixed point and approximation theorems for monotone non-spreading mappings in ordered Banach spaces | Fixed point theorems for Pre\(\psi\{s\}\} almost contraction mappings in orbitally complete metric spaces endowed with directed graphs | An explicit method for solving fuzzy heat equation with integral boundary conditions |
| ID 058 | Khanitin Muangchoo-in | ID 121 | Porphimon Boriwan |
| ID 173 | Azadeh Hosseinpour |

| 05.15 - 05.30 pm. | Viscosity approximation method for split common null point problems between Banach spaces and Hilbert spaces | Existence and uniqueness of coupled best proximity in complex valued metric spaces | Existence theorems for coincidence points of generalized contractive mappings in cone b-metric spaces |
| ID 131 | Khanittha Promluang | ID 167 | Seyed Masoud Aghayan |
| ID 088 | Natthaphon Artsawang |
ABSTRACTS

Keynote Speakers
Split Common Null Point Problems and Split Common Fixed Point Problems

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Abstract

Let \(H_1\) and \(H_2\) be two real Hilbert spaces. Let \(D\) and \(Q\) be nonempty, closed and convex subsets of \(H_1\) and \(H_2\), respectively. Let \(A : H_1 \to H_2\) be a bounded linear operator. Then the split feasibility problem is to find \(z \in H_1\) such that \(z \in D \cap A^{-1}Q\). Given two set-valued mappings \(G : H_1 \to 2^{H_1}\), \(B : H_2 \to 2^{H_2}\) and a bounded linear operator \(A : H_1 \to H_2\), the split common null point problem is to find a point \(z \in H_1\) such that \(z \in G^{-1}0 \cap A^{-1}(B^{-1}0)\), where \(G^{-1}0\) and \(B^{-1}0\) are null point sets of \(G\) and \(B\), respectively. Given two mappings \(T : H_1 \to H_1\), \(U : H_2 \to H_2\) and a bounded linear operator \(A : H_1 \to H_2\), the split common fixed point problem is to find a point \(z \in H_1\) such that \(z \in F(T) \cap A^{-1}F(U)\), where \(F(T)\) and \(F(U)\) are fixed point sets of \(T\) and \(U\), respectively. Defining \(T = P_D\) and \(U = P_Q\) in the split feasibility problem, we have that \(z \in D \cap A^{-1}Q\) is equivalent to \(z \in F(T) \cap A^{-1}F(U)\). Furthermore, defining \(T = J\) and \(U = Q_s\) in the split common null point problem, where \(J\) and \(Q_s\) are resolvents of \(G\) for \(r > 0\) and \(B\) for \(s > 0\), we get that \(z \in G^{-1}0 \cap A^{-1}(B^{-1}0)\) is equivalent to \(z \in F(T) \cap A^{-1}F(U)\). Thus the split common fixed point problem generalizes the split feasibility problem and the split common null point problem. Putting \(U = A'(I - P_Q)A\) in the split feasibility problem, where \(A'\) is the adjoint operator of \(A\), we have that \(U : H_1 \to H_1\) is an inverse strongly monotone operator. Furthermore, if \(D \cap A^{-1}Q\) is nonempty, then \(z \in D \cap A^{-1}Q\) is equivalent to \(z = P_D(I - \lambda A'(I - P_Q)A)z\), where \(\lambda > 0\). By using such results regarding nonlinear operators and fixed points, many authors have studied split feasibility problems, split common null point problems and split common fixed point problems in Hilbert spaces. However, we have not found such results outside Hilbert spaces.

In this talk, motivated by split feasibility problems, split common null point problems and split common fixed point problems in Hilbert spaces, we first solve split common null point problems for metric resolvents and generalized resolvents of maximal monotone operators in two Banach spaces. Furthermore, we introduce new nonlinear operators in Banach spaces which simultaneously extend well-known mappings in Hilbert spaces and Banach spaces. Using hybrid methods, Mann’s type iterations and Halpern’s type iterations, we prove weak convergence theorems and strong convergence theorems for such operators in Banach spaces which are connected with split feasibility problems, split common null point problems and split common fixed point problems in Hilbert spaces and Banach spaces.

Keywords: Maximal monotone operator; iteration procedure; split feasibility problem; split common null point problem; split common fixed point problem; duality mapping
On my two recent papers

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Abstract

The talk will give more details on two papers [1,2]. For [1], a new approach will be presented. Its proof is much more simpler than the one given in [1]. As for [2], a sketch of proof as well as its applications in economics will be given.

References:

Weak and Strong Convergence Theorems of Accelerated Mann and CQ-Algorithms for Nonexpansive Mappings in Hilbert Spaces

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Abstract

In this talk, first, we introduce the inertial accelerated Mann and the inertial CQ-algorithms by combining the accelerated Mann algorithm and the CQ-algorithm with the inertial extrapolation, respectively. Second, we intend to speed up the convergence of the given algorithms. Finally, we give the numerical experiments to illustrate that the inertial accelerated Mann algorithm may have more advantage than other methods in computing for some cases and the inertial CQ-algorithm is more effective than the CQ-algorithm. Our results improve the corresponding results given by some authors.

Keywords: Nonexpansive mapping; the inertial algorithm; the CQ-algorithm; the inertial Mann algorithm; the Mann algorithm; the accelerated Mann algorithm.
Variational Convergence and Applications in Optimization

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ABSTRACT

Convergence is the first basic notion in continuous mathematics which plays important roles in most areas of this field of mathematics. There have been many notions of convergence in analysis, probability theory, numerical methods, etc. For optimization and related fields, naturally kinds of convergence which preserve variational properties like being minimum points, minsup points, saddle points, extremal values, etc, are crucial from various aspects. Variational convergence is the general terminology for such kinds of convergence.

Epi convergence for unifunctions, epi/hypo convergence and lopside convergence for bifunctions are main notions of variational convergence. Epi convergence was introduced more than half a century ago, and the other two have been developed for three decades now. In 2009, lopside convergence for finite-valued bifunctions was proposed and lead to a new effective approach for variational convergence and applications.

In this talk, we focus on lopside and epi/hypo convergence of finite valued bifunctions and applications in optimization. We also aim to a systematic exposition of the theory of variational convergence, from epi convergence of unifunctions to lopside and epi/hypo convergence and finally to applications in approximating optimization problems and estimating solutions of stochastic optimization problems. We present the theory for the general setting of topological spaces, but try to illustrate it by simple applications.

KEYWORDS: Epi/hypo convergence; lopsided convergence; finite-valued bifunctions defined on nonrectangular domains; tightness; variational properties.
Generalized alternative theorems based on set-relations

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Abstract

Alternative theorems such as Farkas’ lemma and Gordan’s theorem usually play important roles in considering optimization problems and because of that, many kinds of valuable extensions have been established; Jeyakumar [1] produces a generalized Gordan’s theorem for a vector-valued function in 1986. Li [3] in 1999 and Yang et al. [5] in 2000, extend it to the case of set-valued maps. However, these theorems rely on some assumptions related to convexity to make systems in a bilinear form.

In this talk, I would like to introduce alternative theorems from a set-valued analytic point of view, using the set-relations proposed by Kuroiwa, Tanaka, and Ha [2] in 1997. They can be considered in a topological vector space with the set-relations induced by a convex ordering cone. A similar approach with scalarizing functions for vectors had been done by Nishizawa, Onodsuka, and Tanaka [4] in 2005. They prove some alternative theorems with no convex assumption by nonlinear scalarizations, not bilinear forms. We reviewed these results and found a way of generalizations. I show 12 types of alternative theorems given by scalarizing functions for sets. Comparing with previous studies, our results achieve the subdivision of the case and the simplification of the forms of them simultaneously. Also, important properties are still conserved.

Reducing some conditions, we recognize that some of 12 types imply several Gordantype theorems. This fact may allow our theorems to have a suitability of extensions of previous results. Moreover, we show some application to semidefinite optimization problems.

Keywords: Generalized alternative; set-relation

References:

Split type Problems in Nonlinear Analysis

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ABSTRACT

In this talk, we shall discuss some spilt type problems from nonlinear analysis, namely, convex feasibility problems, split feasibility problems, split common fixed point problem, split variational inequality problems, hierarchical variational inequality problems, split hierarchical variational inequality problems, split hierarchical variational inclusion problem, etc. We shall discuss several applications of these problems. We shall mention several iterative methods for finding the solutions of above mentioned problems.
ABSTRACTS
Invited Speakers
\textbf{\lambda\textendash points in Orlicz spaces}

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\textbf{ABSTRACT}

Let \((X, \|\cdot\|_X)\) be a real Banach space and \(B(X)\) be the closed unit ball of \(X\). Denote by \(\text{ext} B(X)\) the set set of all extreme points of \(B(X)\). A function \(\lambda : B(X) \rightarrow [0,1]\) defined for any \(x \in B(X)\) by the formula

\[
\lambda(x) = \sup \{ \lambda \in [0,1] : x = \lambda e + (1 - \lambda)y, \ e \in \text{ext} B(X), \ y \in B(X) \}
\]

is called \(\lambda\text{-function}\). In the case when \(\text{ext} B(X) = \emptyset\), we assume that \(\lambda(x) = 0\) for any \(x \in B(X)\).

A point \(x \in B(X)\) is said to a \(\lambda\text{-point of } B(X)\) if \(\lambda(x) > 0\). If every point of \(B(X)\) is a \(\lambda\)-point, then \(X\) is said to have the \(\lambda\text{-property}\). Moreover, if

\[
\lambda_X = \inf \{ \lambda(x) : x \in S(X) \} > 0,
\]

then \(X\) is said to have the uniform \(\lambda\text{-property}\).

The \(\lambda\)-property was introduced by Aron and Lohman [1]. The \(\lambda\)-property is important because for Banach spaces with the \(\lambda\)-property we have that \(\overline{\text{co}}(\text{ext} B(X)) = B(X)\). Moreover, Aron, Lohman and Granero proved in [2] that a Banach space \(X\) has the \(\lambda\)-property if and only if it has the convex series representation property, i.e. for each \(x \in B(X)\), there is a sequence \((e_k)\) of extreme points of \(B(X)\) and a sequence of non-negative real numbers \((\lambda_k)\) such that \(\sum_{k=1}^{\infty} \lambda_k = 1\) and \(x = \sum_{k=1}^{\infty} \lambda_k e_k\). It has been also shown in [2] that the uniform \(\lambda\)-property for a Banach space \(X\) is equivalent to the uniform convex series representation property for \(X\), i.e. convex series representation property in which the sequence \((\lambda_k)\) does not depend on \(x\).

Among others, a criterion for \(\lambda\text{-points of the unit ball in Orlicz spaces generated by arbitrary Orlicz functions (that is Orlicz functions which vanish outside zero and which attain infinite values to the right of some point } u > 0 \text{ are not excluded) and equipped with the Orlicz norm is given. Moreover, Orlicz spaces with \(\lambda\text{-property are characterized. In contrast to results in [5], Orlicz spaces considered by us need not have always the } \lambda\text{-property.}

\textbf{REFERENCES:}

[4] A. Bohonos, R. Pluciennik, Uniform \(\lambda\text{-property in } L^1 \cap L^\infty, \text{ Comment Math. (accepted for publication).} \)
Fixed point and best proximity point theory with graphs and rate of convergence of some iterative methods

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Abstract

In this talk, we first discuss the development of fixed point theory of various classes of nonlinear mappings in both metric spaces and Banach spaces with directed graphs after that best proximity point theorems for some nonlinear mappings are discussed in Banach spaces with directed graphs. We also discuss rate of convergence of various iterative methods for finding fixed points of some nonlinear mappings. Finally, some open questions related to our talk are posed.

Keywords: fixed point theory; best proximity point theorems; directed graph; weak contraction mappings; generalized nonexpansive mappings

References:


The authors were supported by the Thailand Research Fund under the project RTA 5780007 and Chiang Mai University.
Borwein–Preiss Variational Principle Revisited

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\textbf{Abstract}

In this article, we refine and slightly strengthen the metric space version of the Borwein–Preiss variational principle due to Li and Shi \cite{Li}, clarify the assumptions and conclusions of their Theorem 1 as well as Theorem 2.5.2 in Borwein and Zhu \cite{BorweinZhu}, and streamline the proofs. Our main result is formulated in the metric space setting. When reduced to Banach spaces, it extends and strengthens the smooth variational principle established in Borwein and Preiss \cite{BorweinPreiss}, along several directions. Moreover, we introduce and characterize two seemingly new natural concepts of \(\varepsilon\)-minimality, one of them dependant on the chosen element in the ordering cone and the fixed “gauge-type” function, and extend our main result to the vector setting.

\textbf{Keywords}: Borwein-Preiss variational principle, smooth variational principle, gauge-type function, perturbation.

\textbf{References}:

\begin{itemize}
\end{itemize}
An iterative algorithms for generalized mixed equilibrium problems and fixed point of nonexpansive semigroups

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Abstract
In this talk, by using the modified viscosity approximation method associated with Meir-Keeler contractions, we proved the convergence theorem for solving fixed point problem of a nonexpansive semigroup and generalized mixed equilibrium problems in Hilbert spaces.

Keywords: Meir-Keeler contraction mappings, left regular, generalized mixed equilibrium problems, variational inequalities, nonexpansive semigroups.

References:

This work was supported by the Basic Science Research Program through the National Research Foundation(NRF) Grant funded by Ministry of Education of the republic of Korea(2015R1D1A1A09058177)
Resolvents of convex functions in a complete geodesic space with curvature bounded above

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Abstract

In this talk, we introduce the notion of resolvent for a proper lower semicontinuous function defined on a complete geodesic space with curvature bounded above by one, and show several important properties of this operator. The resolvents of convex functions on Banach and Hilbert spaces have been investigated by many researchers and that defined on a Hadamard space has been studied by Jost [2], Mayer [4], and others. We show that our new notion is a generalization of classical resolvents and it can be applied to convex optimization in a complete geodesic space.

This is the joint work with Professor Fumiaki Kohsaka in Tokai University.

Keywords: Convex function; geodesic space; minimizer; resolvent.

References:
Stochastic and decentralized optimization for smart grid energy management

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ABSTRACT

The transformation of energy systems is accelerating. Local initiatives are blossoming, triggered by the drop in renewable energy costs and by the impulse of decentralized actors (individuals, collectivities). With myriads of decentralized intermittent sources (wind, sun) and of actors, managing an energy system is becoming more and more challenging. We present how stochastic and decentralized optimization can contribute to formulate and to solve problems of energy management with micro grids, smart grids and renewable energies.

KEYWORDS: optimization; stochastic; decentralized; energy; smart grid

REFERENCES:

Recent development in fuzzy metric fixed point theory

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ABSTRACT

In this talk, we discuss on the recent development in the area of fuzzy metric fixed point theory. In particular, we present several new fixed point results along with some new open problems in this topic.

KEYWORDS: fuzzy metric space; Fuzzy contractive mappings; fixed point

REFERENCES:
Recent results for single-valued and multi-valued mappings in some geodesic spaces

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Abstract

In this talk, we discuss our recent results in complete CAT(0) and CAT(1) spaces. We are interested in both single-valued and multi-valued mappings. Many results are shown that they not only extend but also significantly improve previous known ones.

Keywords: fuzzy metric space; Fuzzy contractive mappings; fixed point

References:

Abstract

In this paper, existence of a nonempty pointed convex cone with empty topological interior and nonempty algebraic interior for an arbitrary infinite dimensional linear topological space is proved. A multivalued version of Farakas’s lemma in the setting of ordered linear spaces is established. By using it, an equivalence relation between the solution set of some generalized vector equilibrium problems and the corresponding minimization problems are provided. The techniques are used in this note different from the KKM theory and fixed point theory. Some examples in order to support the main results are given.

Keywords: Multivalued map, generalized vector equilibrium problems, pointed convex cone, Farkas’s Lemma, weakly efficient solution, globally efficient solution, superefficient solution.

References:

On the stability conditions for equilibrium problems and related problems

Lam Quoc Anh* and Pham Thi Vui
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Abstract

In this report, we consider the class of equilibrium problems. Sufficient conditions for the stability and sensitivity analysis of the solution sets of such problems are proposed. These topics are also studied for some problems related to optimization.

Keywords: Equilibrium problem, variational inequality, optimization problem, variational inclusion, stability, sensitivity analysis, well-posedness

References:

Sequential Optimality Conditions for Infinite Fractional Programming Problem with DC Functions

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Abstract

In this paper, the absence of any constraint qualifications, a sequential Lagrange multiplier rule condition characterizing optimality for an infinite fractional programming problem with DC functions is obtained in terms of the subdifferentials of the functions involved at the minimizer. The significance of this result is that it yields the standard Lagrange multiplier rule condition for the infinite fractional programming problem under a simple closedness condition that is much weaker than the well-known constraint qualifications. A sequential condition characterizing optimality involving only subdifferentials at nearby points to the minimizer is also investigated. As applications, the proposed approach is applied to investigate sequential optimality conditions for fractional with DC function, fractional and DC optimization problem.
Existence and approximation of minimizers of convex functions in geodesic metric spaces

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Abstract

Using the resolvents of convex functions in complete geodesic metric spaces with nonpositive curvature and with curvature bounded above, we study the problem of approximating minimizers of convex functions in such spaces. We then obtain existence and convergence theorems for finding solutions to this problem. Among other things, we obtain some counterparts of Rockafellar’s results on the proximal point algorithm for convex functions in the geodesic metric space setting. This is joint work with Professor Yasunori Kimura in Toho University, Japan.

Keywords: CAT(0) spaces, CAT(1) spaces, convex function, proximal point algorithm

References:

Digital topological based fixed point theory and its applications

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Abstract

In this talk, we studies the fixed point theory from the viewpoint of digital topology. Motivated by the ordinary Banach contraction principle [1], we can consider their digital versions. More precisely, in digital topology, we say that a digital image $(X,k)$ has the fixed point property if every $k$-continuous map $f: (X,k) \rightarrow (X,k)$ has a fixed point $x \in X$, i.e. $f(x) = x$. Unlike the formal research into the fixed point property, we have some intrinsic features in digital digital versions of fixed point theorems [1,2,3,4,6]. This approach can be used in certain areas in applied sciences.

Keywords: digital topology; Banach contraction principle; digital homotopy

References:

ABSTRACTS

Oral Presenters
Random fixed point theorem for a random Hardy-Rogers mappings

Plern Saipara, Poom Kumam and Yeol Je Cho

Abstract

The main objective of this paper is to prove theorem of a random fixed point for a random Hardy-Rogers mappings. The main result in this paper is the identification of some theorems of a random fixed point and the interrelated application.

Keywords: a random fixed point, a random Hardy-Rogers mappings

References:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
Some fixed point theorems for multivalued $F$-fuzzy contraction mappings in fuzzy metric spaces

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Abstract

In this paper, we introduce a new concept of fuzzy fixed points for multivalued $F$-fuzzy contraction mappings in fuzzy metric spaces. We prove the existence of fuzzy fixed points for multivalued $F$-fuzzy contraction mappings on fuzzy metric spaces.

Keywords: $F$-fuzzy contraction mapping; fixed point; Fuzzy mappings; Fuzzy metric spaces.

References:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.59000399).
Multidimensional coincidence point theorems for $(\psi)$–weak contractions in partially ordered fuzzy metric spaces

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Abstract

In this paper, using the notion of $(\psi)$–weak contraction is extend to partially ordered fuzzy metric spaces in the sense of George and Veeramani. The existence of coincidence points for nonlinear mappings in any number of variables, we will generalize the concept of $(\psi)$–weak contraction in partially ordered fuzzy metric spaces. Then, coincidence point results for two maps are obtained.

Keywords: partially ordered fuzzy metric spaces; mixed monotone property; coincidence point; $(\psi)$–weak contraction.

References:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.59000399).
New coupled fixed point results for $F$-contractive mappings in a metric space endowed with a graph and applications

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Abstract

The purpose of this paper is to present some existence results of coupled fixed points for $F$-type contraction type operators in metric spaces endowed with a directed graph. Our results generalize the results obtained by Gnana Bhaskar and Lakshmikantham in (Nonlinear Anal. 65:1379-1393, 2006). We also have applied to some integral systems.

Keywords: fixed point; coupled fixed point; $F$-contraction; metric space; connected graph;

References:


The authors were supported by Theoretical and Computational Science (Tacs) Center (Project Grant No.TaCS2559-2).
Fixed point results for generalized \((\psi, \phi)_s\)-contractive mappings in rectangular \(b\)-metric spaces

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Abstract

The aim of this paper is to present the definition of a weak altering distance function and a new generalized contractive mapping in rectangular \(b\)-metric spaces. We discuss the fixed point results of such a mapping in rectangular \(b\)-metric spaces.

Keywords: Fixed point; rectangular metric space; rectangular \(b\)-metric space; partially ordered set; weak altering distance function.

References:


The authors were supported by Theoretical and Computational Science Center (TaCS), Science Laboratory Building, Faculty of Science, King Mongkut’s University of Technology Thonburi (KMUTT).
Endpoints of multivalued nonexpansive mappings in geodesic spaces

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Abstract

Let $E$ be a nonempty subset of a Banach space $X$ and $T : E \to \mathcal{K}(E)$ be a multivalued mapping. A point $x \in E$ is called an endpoint of $T$ if $T(x) = \{x\}$. It is shown that a multivalued nonexpansive mapping on a bounded closed convex subset of a uniformly convex Banach space has an endpoint if and only if it has the approximate endpoint property. This is the first result regarding the existence of endpoints for such kind of mappings even in Hilbert spaces. The related result in a complete CAT(0) space is also given.

Keywords: endpoint; fixed point; multivalued nonexpansive mapping; Banach space; CAT(0) space

References:

Convergence theorems in CAT(0) space and an application

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Abstract

The aim of present paper is to introduce a new iterative process involving a finite family of multivalued nonexpansive mappings in CAT(0) spaces. We prove some $\Delta$-convergence and strong convergence theorems for the proposed scheme with and without end point conditions. The newly defined iteration scheme is also utilized to an application in image recovery problem. In process, our results generalize and extend the corresponding results of Uddin et al., Abbas et al., Eslamian and Abkar, Bunyawat and Suantai, Khan, Khan and Fukhar-ud-din and Fukhar-ud-din and Khan and references cited therein.

Keywords: CAT(0) space, Fixed point, $\Delta$-convergence, Opial’s property and image recovery.

References:
Fixed point theorems for fundamentally nonexpansive mappings in CAT($\kappa$) spaces

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Abstract

In this paper, we obtain fixed point theorems and $\Delta$-convergence theorems for fundamentally nonexpansive mappings on CAT($\kappa$) spaces with $\kappa > 0$. Our results extend and improve some results of Salahifard et al. [1], and many others.

Keywords: CAT($\kappa$) space; fixed point; $\Delta$-convergence; generalized nonexpansive mapping.

References:


The author was supported by the Ministry of Science and Technology, Thailand and the Graduate School, Chiang Mai University, Chiang Mai, Thailand.
A Convergence Theorem for a Finite Family of Multivalued $k$-Strictly Pseudononspeeding Mappings in $\mathbb{R}$-Trees

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Abstract

In this work, we introduce a new $m$-step iterative process for finite family of $k$-$\mathcal{L}$-strictly pseudononspeeding multivalued mappings in $\mathbb{R}$-trees. We obtain a strong convergence theorem of $m$-step iterative method to a common fixed point of a finite family of those multivalued mappings in $\mathbb{R}$-trees. Our results extend many known recent results in the literature. We close this work with the first examples of $k$-$\mathcal{L}$-strictly pseudononspeeding multivalued mappings in $\mathbb{R}$-trees.

Keywords: fixed point; multivalued mapping; $\mathbb{R}$-tree; $k$-$\mathcal{L}$-strictly pseudononspeeding; convergence theorems.

References:

Some coincidence points for multi-valued F-weak contractions on complete metric spaces endowed with a graph

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Abstract

In this paper, we introduce the concepts of weak \(g\)-graph-preserving for multi-valued mappings and weak F-G-contractions in a metric space endowed with a directed graph. We establish some coincidence point theorems for this type of mappings in a complete metric space endowed with a directed graph. Examples illustrating our main results are also presented. Our results extend and generalize various known results in the literature.

Keywords: coincidence point; F-contraction; metric space; connected graph;

References:


The authors were supported by Theoretical and Computational Science (Tacs) Center (Project Grant No.TaCS2559-2).
Modified Forward-Backward Splitting Methods for Accretive Operators in Banach Spaces

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ABSTRACT

In this research, we propose the modified splitting method for accretive operators in Banach spaces and prove some strong convergence theorems of the proposed method under suitable conditions. Finally, we give some applications to the minimization problems.

KEYWORDS: Accretive operator; Banach space; splitting method; forward-backward splitting method

REFERENCES:


This research was supported by the Thailand Research Fund and University of Phayao under Grant TRG5780075.
An iterative approximation scheme for solving a split generalized equilibrium, variational inequalities and fixed point problems

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Abstract

In this paper, we introduce a new iterative method for finding a common element of the set of solutions of the split generalized equilibrium problem, the set of the variational inequality for \(\beta\)-inverse strongly monotone mappings, and the set of fixed point of nonexpansive mappings in Hilbert spaces. We show that the sequence converges strongly to a common element of the above three sets under some controlling conditions.

Keywords: Fixed point; Variational inequality; Viscosity approximation method; Nonexpansive mapping; Hilbert space; Split generalized equilibrium problem; Strong convergence

References:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
Variational convergence of bifunctions on nonrectangular domains and applications

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Abstract

Variational convergence of extended-real-valued functions has been developed for half a century with many important applications. In 2009 Jofre and Wets considered variational convergence of finite-valued bifunctions defined on rectangles and considered its variational properties. Since then, there have been a number of contributions in this direction including application in optimization. However, quasivariational problems cannot be expressed in terms of such bifunctions on rectangles, because their constraint sets depend on the variables of the problems. The aim of this paper is to extend epi/hypo and lopsided convergence, the main kinds of variational convergence of bifunctions, to the case of finite-valued bifunctions defined on nonrectangular domains and apply them to quasivatiational models. Their basic characterizations are established. Variational properties such as saddle points, minsup points, sup-projections, etc, of bifunctions are shown to be preserved for the limit bifunctions when the bifunctions epi/hypo converge to these limits (possibly under some additional assumptions) and applied to approximations of quasiequilibrium problems. The obtained results are new and, in the special case of bifunctions defined on rectangles, they also improve some known results.

Keywords: Epi/hypo convergence; lopsided convergence; finite-valued bifunctions defined on nonrectangular domains; tightness; variational properties; saddle points; quasiequilibrium problems, multiobjective quasioptimization, generalized Nash equilibria.

References:

37
A common fixed point theorem for six self maps in fuzzy metric spaces using implicit relation and property (CLRg)

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Abstract

In this note we generalize the results of S.Kumar and S.Chouhan[S.Kumar and S.Chouhan , common fixed point theorems using implicit relation and property (E.A.) in fuzzy metric spaces , Annals of fuzzy mathematics and informatics, 5(1)(2013), 107-114] by using (CLRg) property and implicit relation. The purpose of this note is to prove a common fixed point theorem for six self maps in fuzzy metric spaces using the property (CLRg) and contractive type implicit relation.

Keywords: fuzzy metric space, common fixed point; weakly compatible maps; implicit relation and property CLRg.

References:
Fixed point theorems for simulation functions in $b$-metric spaces via the $wt$-distance†

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ABSTRACT

The purpose of this article is to prove some fixed point theorems for simulation functions in complete $b$–metric spaces with partially ordered by using $wt$-distance which introduced by Hussain et al. (2014). Also, we give some examples to illustrate our main results.

KEYWORDS: Fixed point; simulation function; $b$-metric space; $wt$-distance; $w$-distance; generalized distance.

REFERENCES:


The first author was supported by Thailand Research Fund (Grant No. TRG5880221) and Kasetsart University.
Adaptive subgradient method for the split quasi-convex feasibility problems

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Abstract

In this talk, we consider a type of the celebrated convex feasibility problem, named a split quasi-convex feasibility problem. This problem is to find a point in a sublevel set of a quasi-convex function in one space and its image under a bounded linear operator is contained in a sublevel set of another quasi-convex function in the image space. We propose a new adaptive subgradient algorithm for solving this considered problem. We then discuss the convergence analyses for two cases: the case where the functions are upper semicontinuous in the finite dimensional settings, and the second one where the functions are demicontinuous in the infinite dimensional settings. We also give a numerical example to support the convergence results.

Keywords: Split feasibility problem; Quasi-convex feasibility problem; Adaptive Subgradient method; Convergence

References:


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N. Nimana was supported by the Thailand Research Fund through the Royal Golden Jubilee Ph.D. Program (Grant No. PHD/0079/2554) and Naresuan University.
Equilibrium problems in Hadamard manifolds

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Abstract

Equilibrium problems are well-widely considered by nonlinear analysts and optimization theorists as a central theory of unifying nonlinear variational models. Classical model focus on an objective bifunction defined on a squared product of a convex set. In our talk, we consider instead a product between two convex sets that are proximal to one another. Moreover, the underlying space in our results is assumed to be a Hadamard manifold, i.e., a complete and simply connected Riemannian manifold with nonpositive sectional curvatures. The reason behind a Hadamard manifold domain is that it allows us to transform various complicate constrained and nonconvex problems into a non-constrained and convex one.

Keywords: Equilibrium problem, Best proximity point, Hadamard manifold

References:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
Optimal Approximate Solution: Best proximity Point theorems for generalized nonlinear contraction mappings

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Abstract

In this paper, we obtained the best proximity point theorem for α-Geraghty contractions in the setting of complete metric spaces by using weak P-property. Also we presented some examples to prove the validity of our results. Our results extended and unify many existing results in the literature.

Keywords: Best proximity point, weak P-property, triangular α-admissible.

References:

Best proximity point theorems for multivalued $F$-contractive mappings

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Abstract

In this article, we introduce the notion of multivalued $F$-contraction mapping and we also prove the existence best proximity point theorems in complete metric spaces.

Keywords: Best proximity point; Fixed point; P-property; $F$-contraction; multivalued mapping

References:


The authors were supported by the Theoretical and Computational Science (TaCS) Center (Project Grant No. TaCS2559-2).
Best proximity point multivalued cyclic $F$-contraction

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Abstract

In this paper we prove the existence of best proximity point for multivalued cyclic $F$-contraction and state some result in the complete metric space.

Keywords: best proximity point; cyclic $F$-contraction; multi-valued contraction; metric space

References:


The authors were supported by the Theoretical and Computational Science (TaCS) Center (Project Grant No.Tacs2559-2)
On Existence of Coincidence and Common Fixed Point of Faintly Compatible Pair of Maps

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ABSTRACT

Motivated by the fact that a wide variety of problems appearing in distinctive areas of pure and applied mathematics can be modeled as fixed point equations of the form \( f(x) = x \), the aim of this talk is to discuss the existence of coincidence and common fixed point of a faintly compatible discontinuous pair of maps without using the containment requirement of involved maps. Results to be discussed improve, generalize and extend many results existing in the literature and are supported with an illustrative example.

KEYWORDS: Coincidence point; common fixed point; conditional reciprocal continuity and faint compatibility.

REFERENCES:
Fixed Point Theorems for $F_w$-Contractions in Complete S-Metric Spaces

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ABSTRACT

In this paper, we define a $w$-distance on a complete S-metric space, which is a generalization of the concept of the $w$-distance due to Kada, Suzuki and Takahashi. Also, we introduce the concept of the $F_w$-contraction in a complete S-metric space and extend the fixed point theorem due to Malhotra and Bansal. We also discuss an example.

KEYWORDS: $w$-distance; $F$-contraction; $F_w$-contraction; Complete S-metric spaces

REFERENCES:


This work was funded by Faculty of Science, Lampang Rajabhat University.
Some common minimum-norm fixed points of a finite family of $\sigma$-asymptotically quasi-nonexpansive nonself-mappings with applications

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Abstract

In this paper, we consider the two-step iteration for a finite family of $\sigma$-asymptotically quasi-nonexpansive nonself-mappings and prove some strong convergence theorems of the proposed sequence $\{x_n\}$ for this family in real uniformly convex and uniformly smooth Banach spaces. Further, we give one an application of the main result.

Keywords: $\sigma$-asymptotically quasi-nonexpansive nonself-mapping; strong convergence; fixed point; uniformly convex and uniformly smooth Banach space.

References:


The authors were supported by the Petchra Pra Jom Kla Doctoral Scholarship.
\(\varphi\)-fixed point theorems for generalized \((F,\varphi)\)-contraction mappings in metric spaces with applications

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Abstract

In this work, we introduce a new generalization of \((F,\varphi)\)-contraction mappings due to Jleli et al. [1] and establish some existence results of \(\varphi\)-fixed point for such mappings. We also state some illustrative example to support our results. Furthermore, we prove some \(\varphi\)-fixed point results for generalized contraction in partial metric spaces by using the main results.

Keywords: partial metric spaces; \((F,\varphi)\)-contraction mappings; \(\varphi\)-fixed points

References:

Fixed point results for $F_{\mathbb{R}}$-contractions and solving the nonlinear matrix equation

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Abstract

In this work we introduce the notion of a $F_{\mathbb{R}}$-contraction, which by improve the idea of Wardowski [1] under a nonempty binary relation. We give some fixed point results for $F_{\mathbb{R}}$-contractions in complete metric spaces and also give an illustrative example. Furthermore, multidimensional fixed point theorems are derived from our main results. As an application, we apply our main result to study a nonlinear matrix equation. Additionally, we give numerical data to support our application by using Matlab.

Keywords: Complete metric space; binary relation; $F_{\mathbb{R}}$-contraction

References:

Best proximity point theorems for Suzuki type proximal contractive multimaps

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Abstract

The aim of this paper is to introduce new Suzuki type proximal contractive multimaps and prove new best proximity results for these multimaps in the setting of a metric space. Our results extend the recent results by Hussain et al. (Fixed Point Theory Appl.(2016) 2016:14 as well as other results in the literature. Some illustrative examples are provided to highlight our findings.

Keywords: multivalued mapping; best proximity point; proximal contractive multimaps; Suzuki type proximal contractive multimaps;

References:


The authors were supported by the Faculty of Science Research Fund, Lampang Rajabhat University, Lampang, Thailand.
Common fixed points for $\alpha$-type $(\phi, \psi)$-weak contraction mapping in intuitionistic fuzzy metric spaces

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Abstract

In this paper, we extend the notation of $\alpha$-type $(\phi, \psi)$-weak contraction mapping in intuitionistic fuzzy metric spaces, and also prove some common fixed point results for this type mapping in intuitionistic fuzzy metric space under some suitable conditions. This result generalize and improve the corresponding results given in the literature.

Keywords: Common fixed points, intuitionistic fuzzy metric space, $\alpha$-admissible, $(\phi, \psi)$-weak contractions

References:


The authors were supported by Theoretical and Computational Science (TaCS) Center (Project Grant No.TaCS2559-2).
Some common fixed points for generalized cyclic contraction mappings with implicit relation and its applications

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Abstract

By the concept of cyclic relation, we introduced a new generalized cyclic contraction with respect to multi-valued mappings under implicit relation and we also consider some of further results of fixed point theorems on multi-valued mappings in a complete metric space. Moreover we obtained some common fixed point theorems for such mappings. In addition, some examples and applications are presented to demonstrate our results.

Keywords: cyclic contraction; implicit relation; common fixed point

References:


The authors were supported by Theoretical and Computational Science (TaCS) Center (Project Grant No.TaCS2559-2).
Fixed point and approximation theorems for monotone nonsparing mappings in ordered Banach spaces

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\textbf{ABSTRACT}

In this work, we will prove some existence theorems of fixed points for monotone nonsparing mappings $T$ in a Banach space $E$ with the partial order $\leq$. In order to finding a fixed point of such a mapping $T$, moreover we also prove the convergence theorem of Ishikawa iterative schemes.

\textbf{KEYWORDS:} Ordered Banach space; fixed point; monotone nonsparing mapping; Ishikawa iteration schemes.

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The authors were supported by Theoretical and Computational Science (TaCS) Center (Project Grant No.TaCS2559-2).
Fixed point and convergence theorems for Suzuki type $Z$-contraction mappings in CAT(0) spaces

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Abstract

In this paper, we study fixed point theorems and convergence theorems for Suzuki type $Z$-contraction mappings in CAT(0) spaces. Our result extend and improve many results in the literature.

Keywords: fixed point; suzuki type $Z$-contraction mappings; convergence theorems; CAT(0) spaces.

References:


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The authors were supported by Theoretical and Computational Science (TaCS) Center (ProjectGrant No.TaCS2559-2).
Fixed point results for generalized $F$-contractions in $b$-metric spaces

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ABSTRACT

In this paper, we introduce the concept of generalized $F$-contraction in $b$-metric spaces. Fixed point results for these contraction mappings in $b$-metric spaces are obtained. Also, we give some examples to illustrate the main results. Our results generalize the result of Wardowski [1].

KEYWORDS: $F$-contraction; $b$-metric spaces

REFERENCES:


The authors were supported by Research Professional Development Project under the Science Achievement Scholarship of Thailand (SAST).
A common fixed point theorem for compatible mappings of type (K) in intuitionistic fuzzy metric space

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Abstract

The study of common fixed point of mappings satisfying contractive type conditions has been a very active field of research during the last three decades. In 2014, K. Jha, V. Popa and K. B. Manandhar introduced the concept of compatible mappings of type (K) in metric space and Manandhar et al. further extended the compatible mappings of type (K) in fuzzy metric space. The purpose of this paper is to obtain a common fixed point theorem for two pairs of self-mappings of compatible of type (K) in a complete intuitionistic fuzzy metric space with example. Our result generalized and improves similar other results in literature.

Keywords: Fuzzy metric space, Compatible mappings, Compatible mappings of type (K) and common fixed point.

References:

Brzdęk’s fixed point theorem approach to generalized hyperstability of the general linear equation

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Abstract

Let \( \mathbb{F}, \mathbb{K} \) be two fields of real or complex numbers and \( X, Y \) be two normed spaces over \( \mathbb{F}, \mathbb{K} \). The aim of this work is to study generalized hyperstability results for general linear equation of the form
\[
g(ax + by) = Ag(x) + Bg(y),
\]
where \( g : X \to Y \) is a mapping and \( a, b \in F\setminus\{0\}, A, B \in K \). Our results are improvement and generalization of main results of Piszczek [1].

Keywords: generalized hyperstability; general linear equation

References:


The authors were supported by Research Professional Development Project under the Science Achievement Scholarship of Thailand (SAST).
New fixed point theorems of multivalued $F$-contractions in modular metric spaces and its application to non-linear integral equations

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**Abstract**

In this paper, we discuss the existence of fixed point for multivalued $F$-contraction in the setting of modular metric spaces. In this connection, we introduce the notion of multivalued $F$-contraction and prove corresponding fixed point theorems in complete modular metric space. Then we apply our result to establish the existence of solutions for a certain type of non-linear integral equations.

**Keywords:** Fixed point, multivalued $F$-contractive, modular metric space
A common fixed point theorem for sequence of mappings in semi-metric space with compatible mapping of type (E)

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Abstract

In 1922, Polish mathematician Stephan Banach established the famous Banach’s Contraction Principal. Since then, it has become milestone to the researchers in analysis to establish new theorems by generalizing this theorem. K. Menger in 1928 introduced the notion of semi-metric space as generalization of metric space. In 2002, M. Aamri and D. El. Moutawakil established the common fixed point theorem for two pairs of self mappings in semi-metric space. Also, in 2007 M. R. Singh and M. Y. Singh introduced the notion of Compatible mapping of type (E) in metric space. In 2014, Rajopadhyaya et. al. established the common fixed point theorem for three pairs of self mappings in semi-metric space using various contractions. The purpose of this paper is to establish a common fixed point theorem for sequence of self mappings in semi-metric space with compatible mappings of type (E).

Keywords: Semi-metric space; Compatible mapping of type (E); Common fixed point

References:

A best proximity point theorem for generalized non-self Kannan and Chetterjea type mappings and Lipschitzian mappings in complete metric spaces

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Abstract

The purpose of this paper is to provide and study a best proximity point theorem for generalized non-self Kannan and Chetterjea type mappings and Lipschitzian mappings in complete metric spaces. The significant mapping in a unified form which related to contractive mappings, Kannan type mappings and Chetterjea type mappings is established. We also provide an example to illustrate the situation corresponding to the main theorem. The main result of this paper can be viewed as a general and unified form of several previously existing results.

Keywords: Optimal approximate solution; Best proximity point; Lipschitzian mapping; Generalized Kannan and Chatterjea type mapping; Cyclic contraction

References:


The author was supported by Naresuan University.
Stability for Lexicographic Vector Equilibrium Problems

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\textbf{Abstract}

In this work, we have studied on stability for Lexicographic Vector Equilibrium Problems (LEP), that is, we study Painlevé-Kuratowski convergence of the solution sets with a sequence of mappings converging continuously and sequence of set converging in the sense of Painlevé-Kuratowski and we also study PK-wellposedness for (LEP). Our main results are new and different from the existing ones in the literature.

\textbf{Keywords:} Lexicographic Vector Equilibrium Problems, PK-wellposedness, Painlevé-Kuratowski convergence, Continuous convergence.

\textbf{References:}


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On vector optimization problems with geometric framework

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Abstract

We will survey some classes of multitime multiobjective variational problems of minimizing a vector of functionals or vector of quotients of curvilinear integral functionals (mechanical work) subject to certain partial differential equations and inequations (limited resources). To state the results on efficiency and optimality, various types of generalized convexities are used. For the considered multitime multiobjective variational problems, several duality results are established under these types of convexity.

Keywords: multitime multiobjective problem, efficient solution, quasiinvexity, duality

References:


Recent results to approximate solution of stochastic differential delay equations

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ABSTRACT

In this talk, we deal with some recent results to approximate solution of a stochastic systems and discuss some difference between an approximate solution and an accurate solution to the special but important class of stochastic delay systems. To make the theory more understandable, we use a non-uniform Lipschitz condition and special linear growth condition.

KEYWORDS: approximate solutions; stochastic differential delay equation; Lipshitz condition; linear growth condition

REFERENCES:
An iterative method for triple-hierarchical problems

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ABSTRACT

In this paper, we introduce the solution of the triple-hierarchical fixed point problems in the real Hilbert spaces. We establish the strong convergence of the proposed method under some mild conditions. The results presented in this paper extend and improve some well-known results in the literature.

KEYWORDS: fixed point problem, hierarchical problem, variational inequality problem

REFERENCES:


Performance measures of $E_2|E_2|1$ queueing system with sinusoidal arrival rate

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ABSTRACT

This paper deals with the study of $E_2|E_2|1$ queueing model with the provision that the customers arrive in the system follows Erlang distribution. The customers arrival rate function is taken to be sinusoidal. The main objective of the paper is to find some performance measures - number of customers in the system, number of customers in the queue, expected time to failure of server. The numerical results have also been shown so as to show that the model under study is realistic.

KEYWORDS: Erlang distribution; Sinusoidal; Queue

REFERENCES:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
A common fixed point theorem for subcompatible mappings in fuzzy metric space

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Abstract

The classical Banach fixed point theorem in metric space is one of the fundamental results in mathematics with wide applications. Also, the study of common fixed points of self mappings in fuzzy metric space satisfying certain contractive conditions as an extension of this Banach contraction principle has been at the center of vigorous research activities. The purpose of this paper is to introduce the notion of subcompatible pair of mappings and to establish a common fixed point theorem for subcompatible pairs of reciprocally continuous self mapping in fuzzy metric space which generalizes and improve similar results of fixed points.

Keywords: fixed point; subcompatible maps; reciprocal continuity; fuzzy metric space

References:

A hybrid optimization of particle swarm optimization and genetic algorithm with multi-parent crossover (GA-MPC)

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Abstract

This paper proposed a hybrid optimization of particle swarm and genetic algorithm with multi-parent crossover is proposed to solve the optimization model problem.

Keywords: equipment maintenance; preventive maintenance; maintenance period optimization; particle swarm optimization; genetic algorithm optimization

References:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
Strong convergence theorems by hybrid and shrinking projection methods for sums of two monotone operators

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Abstract

In this paper, we establish the new iterative algorithm and prove strong convergence theorems for finding the common solution of the sum of two monotone operators and fixed point problems by using hybrid methods and shrinking projection methods.

Keywords: Hybrid methods, Shrinking projection methods, Monotone operators and Resolvent.

References:


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Sensitivity analysis of the quasi variational inequality problem on uniformly prox regular sets

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ABSTRACT

In this paper, we consider the sensitivity analysis of the quasi variational inequality problem over a class of nonconvex sets, as uniformly prox-regular sets. The Wiener-Hopf equation, which equivalent to the quasi variational inequality problem on uniformly prox regular sets is considered. The sensitivity analysis of this problem is studied. The results in this paper improve and extend the variational inequality problems which have been appeared in literature.

KEYWORDS: Sensitivity analysis, quasi variational inequality, uniformly prox-regular set, locally Lipschitz continuous mapping, locally strongly monotone mapping

REFERENCES:


Convergence theorem for solving the combination of equilibrium problems and fixed point problems in Hilbert spaces

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Abstract

In this article, we propose a iterative algorithm for approximating a common element of a finite family of solution sets of equilibrium problems, the set of common fixed points of a finite family of nonspreading mappings and the set of common fixed points of a finite family of $\kappa_i$-strictly pseudo contractive mappings in Hilbert spaces. Furthermore, we prove that the proposed iterative scheme converges strongly to a common element of those three sets. Finally, to support our main results, the numerical examples are given.

Keywords: strictly-pseudo contractive mapping; nonspreading mapping; equilibrium problem; fixed point; Hilbert space

References:

Strong convergence theorems for the modified variational inclusion problems and various nonlinear mappings in Hilbert space

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Abstract

In this paper, we prove a strong convergence theorem for finding a common element of the set of fixed points of a finite family of $\kappa$-strictly pseudononspreading mappings and the set of solutions of a finite family of variational inclusion problems and the set of solutions of generalized equilibrium problem in Hilbert space. By using our main result, we give the numerical example to support some of our results.

Keywords: variational inclusion problems; $\kappa$-strictly pseudononspreading mapping; generalized equilibrium problem; resolvent operator; fixed point problem

References:


Fast Mann and CQ algorithms for a nonexpansive mapping

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Abstract

In this talk, we introduce two fast Mann and CQ algorithms and analyze their convergence and behavior. Firstly, by pointing that Picard algorithm is the steepest descent method for solving the minimization problem, provide the accelerated Picard algorithm by using the ideas of conjugate gradient methods that accelerate the steepest descent method. Then, based on the accelerated Picard algorithm, we present accelerations of the Mann and CQ algorithms. Secondly, we introduce inertial accelerated Mann and inertial CQ algorithms by combining accelerated Mann algorithm and CQ algorithm with inertial extrapolation respectively. This strategy is intended to speed up the convergence of algorithms. The convergence theorems established in this new setting improve known ones.

Keywords: two fast Mann; CQ algorithms

References:
Generalized $(\phi, \psi)$ vector complementarity problem and generalized $(\phi, \psi)$ vector variational inequality problem with fuzzy mappings

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Abstract

In this paper, we introduce and study a generalized $(\phi, \psi)$ vector complementarity problem with fuzzy mappings. Under suitable conditions, we have shown that generalized $(\phi, \psi)$ vector complementarity problem with fuzzy mappings is equivalent to generalized $(\phi, \psi)$ vector variational inequality problem with fuzzy mappings. We derive some existence results for our problem. Results of this paper represent a significant improvement and refinement of the previously known results.

Keywords: Vector; Complementarity problem; Variational inequality; Positive homogeneous; Fuzzy mapping

References:


The authors were supported by The Thailand Research Fund (TRF).
Numerical Simulation of an Air Pollution Model on Industrial Areas by Considering the Influence of Multiple Point Sources

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Abstract

A numerical simulation on a two-dimensional atmospheric diffusion equation of an air pollution measurement model is proposed. The considered area is separated into two parts such as an industrial zone and an urban zone. In this research, the air pollution measurement by releasing the pollutant from multiple point sources above an industrial zone to the other area is simulated. The governing partial differential equation of air pollutant concentration is approximated by using a finite difference technique. The approximated solutions of the air pollutant concentration on both areas are compared. The air pollutant concentration levels that influenced by multiple point sources are also analyzed.

Keywords: multiple point sources; finite difference technique; air pollutant concentration; industrial zone; urban zone

References:

Numerical computation of a water-quality model with advection-diffusion-reaction equation using an upwind implicit scheme

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Abstract

In this research, numerical computations of water-quality model in a uniform flow stream are proposed. The model is governed by a one-dimensional advection-diffusion-reaction equation that provided the pollutant concentrations along the stream. The pollutant concentration is approximated by using a finite difference technique. The upwind implicit scheme is used to approximate the pollutant concentration in each points at each times along a uniform flow stream. The accurate of the proposed technique is compared with the analytical solutions that are shown in a numerical experiment.

Keywords: advection-diffusion-reaction equation; water-quality model; uniform flow stream; upwind implicit scheme

References:


Some common fixed point theorems for generalized cyclic multi-valued contractive operators in complete matric spaces

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Abstract

In this work, we introduce a new generalized contraction which is corresponding to the new class of control functions under a general contractive type condition based on the Hausdorff metric between subsets of a metric space and give some common fixed point results for this introduced contraction in complete metric spaces. This results presented in this work improve and generalize some known corresponding results in the literature.

Keywords: common fixed point; cyclic operator; Hausdorff metric; multi-valued operator; matric spaces

References:


The authors were supported by the Thailand Research Fund through the Royal Golden Jubilee PhD Program (Grant No. PHD/0248/2553) and Naresuan University.
A general iterative method for solving convex optimization problems of the sum of two convex functions

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Abstract

It is well known that the proximal gradient algorithm plays an important role in solving convex optimization problems. In this paper, we use the idea of proximal gradient algorithm, viscosity iterative method and regularization to establish a sequence generated by a general iterative method converges strongly to a convex optimization problems of the sum of two convex functions, which solves a variational inequality under suitable conditions.

Keywords: convex optimization problems; variational inequality; proximal gradient algorithm; fixed point

References:


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On Coupled-Nonexpansive Mappings

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Abstract

In this work, we obtained the properties of the coupled fixed point set for coupled-nonexpansive mappings in Banach spaces. Moreover, we prove such properties of the coupled fixed point set for coupled-nonexpansive mappings and prove some coupled fixed point theorems in Banach spaces.

Keywords: coupled fixed point set; coupled-nonexpansive mappings; coupled fixed point theorems; Banach spaces

References:


The authors were supported by the Science Achievement Scholarship of Thailand.
Existence theorems for coincidence points of generalized contractive mappings in cone $b$-metric spaces

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Abstract

In this paper, we establish some sufficient conditions and then prove some existence theorems of coincidence points of generalized contractive mappings without the assumption of normality in cone $b$-metric spaces. The results not only directly improve and generalize some fixed point results in metric spaces and $b$-metric spaces, but also expand and complement some previous results in cone metric spaces.

Keywords: Cone $b$-metric spaces; Generalized contractive mapping; Coincidence point; Fixed point

References:


The authors were supported by The Thailand Research Fund (TRF).
Coupled fixed point theorems in $C^*$-algebra-valued metric spaces

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Abstract

Let $L(H)$ be the set of bounded linear operators on Hilbert space $H$. We consider a class of operator equations of type

$$X = Q + \sum_{i=1}^{m} A_i^* X A_i - \sum_{i=1}^{m} B_i^* X B_i$$

where $Q$ is a positive operator and $A_i, B_i$ are arbitrary operators in $L(H)$. In this paper, we prove the existence and uniqueness of coupled fixed point for a mixed monotone mapping in $C^*$-algebra-valued metric space. As an application, we prove the existence of solution to such equations.

Keywords: $C^*$-algebra; $C^*$-algebra-valued metric space; coupled fixed point theorem

References:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
Existence results for new extended vector variational-like inequality and equilibrium problems

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Abstract

In this paper, we establish and study some new existence theorems for a new extended vector variational-like inequality and equilibrium problem in Banach space. The results are proved by using the new definition of $g - f - \eta - \phi - \mu$-quasimonotone of Stampacchia and of Minty type mappings. The obtained results in this article can be viewed as some new and generalized forms which can be applied to several problems.

Keywords: new extended vector variational-like inequality and equilibrium problems; Existence results; KKM-mapping; $g - f - \eta - \phi - \mu$-quasimonotone of Stampacchia type; $g - f - \eta - \phi - \mu$-quasimonotone of Minty type mapping; $g - f - \eta - \phi - \mu$-pseudomonotone

References:


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A new two-step fixed points iterative scheme for two asymptotically nonexpansive mappings

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Abstract

In this paper, a new two-step iteration scheme for approximating common fixed points of two asymptotically nonexpansive mappings is defined and we have proved weak and strong convergence theorems in a uniformly convex Banach space. The result presented in this paper improve and extend the recent ones announced by many others

Keywords: Asymptotically nonexpansive; Strong convergence; Weak convergence

References:

A Halpern Iteration for System of Equilibrium and Variational Inequality and Fixed Point Problems of Families of Quasi-\(\phi\)-Asymptotically Nonexpansive in Banach Spaces

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Abstract

In this paper, we introduce a new iterative sequence by using a halpern algorithm for finding the common solution of a system of equilibrium problems for a finite family of bifunctions satisfying the conditions and the fixed point problems for families of quasi-\(\phi\)-asymptotically nonexpansive mapping and the variational inequality problems for a finite family of monotone mapping. Finally, we prove some strong convergence theorem of an iteration generated by the some mild conditions in Banach spaces.

Keywords: Halpern Iteration; Equilibrium Problem; Variational Inequality Problem; Fixed Point Problem

References:


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Abstract

In Thailand, after two severe consecutive winters, drought usually occurs as a result of water shortage caused by less-than-usual amount of rainfall during the rainy season. Unusually high temperature can also cause the following year’s drought, which seriously affects agricultural productivity negatively [1]. Both high temperature and limited rainfall in the North East of Thailand can be used to predict the severity of Thailand’s drought nation-wide. In this study, the grey relational decision-making method was applied to calculate the degree between the weighted temperature and rainfall, while the amount of rainfall represented the main factor of the decision targets and the comparison of fuzzy clustering [2] and grey system model (GM)[3] was applied to predict the final drought analysis.

Keywords: grey relational; fuzzy clustering; prediction drought; GM(grey system model)

References:


Painlevé-Kuratowski variational inclusion problems

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ABSTRACT

In this paper, we aim to establish some results for the solution set of a variational inclusion problems with set-valued mapping and we study Painlevé-Kuratowski convergence of the solution sets with a sequence of mappings converging continuously and sequence of set converging in the sense of Painlevé-Kuratowski.

KEYWORDS: Painlevé-Kuratowski convergence; variational inclusion problems; set-valued mapping

REFERENCES:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
Weak Pareto-optimality for multiobjective optimization involving tangentially convex functions

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Abstract

We consider the multiobjective optimization problem (MOP) over a feasible set which is described by inequality constraints that are tangentially convex. In this paper we present necessary and sufficient conditions for the weakly Pareto optimal solutions of (MOP) in terms of tangential subdifferentials.

Keywords:

References:

Sequential optimality conditions for fractional convex optimization problems

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Abstract

In this paper, using a general approach which provides sequential optimality conditions for a general convex optimization problem and is given in terms of the \(\varepsilon\)-subdifferentials, we derive necessary and sufficient optimality conditions for fractional convex optimization problems is obtained in terms of the \(\varepsilon\)-subdifferentials of the functions involved at the minimizer and sequential characterization of optimal solution involving the convex subdifferential.

Keywords: Convex programming; Conjugate function; Perturbation theory; Sequential optimality conditions

References:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
Variational Inequalities for L-fuzzy Mappings.

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\textbf{ABSTRACT}

In this article we introduce the notion of variation inequalities for L-fuzzy mappings. We propose some iterative algorithms by virtue of projection methods, and study the convergence criteria for these algorithms. Our results extend/generalize some eminent results already present in the literature.

\textbf{KEYWORDS:} Variational Inequalities; L-fuzzy Mappings

\textbf{REFERENCES:}


SOME QUADRUPLED BEST PROXIMITY POINT THEOREMS IN PARTIALLY ORDERED METRIC SPACES

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Abstract

In this paper, we prove some quadrupled best proximity point theorems in partially ordered metric space by using \((\psi, \phi)\) contraction. Our result generalises the result of Kumam et.al. (Coupled best proximity points in ordered metric spaces, Fixed point Theory and Applications 2014, 2014:107.). An example is also given to verify the results obtained.

Keywords: partial ordered set, best proximity point, quadrupled fixed point, quadrupled best proximity point.

References:

Attractive points, acute point and fixed point properties for nonlinear mappings

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Abstract

In this talk, we study the concepts of acute points of a nonlinear mapping. Further, we introduce the concepts of common acute points of a family of nonlinear mappings. We study fixed point properties for nonlinear mappings. We also study some properties of acute points, attractive points and fixed points. Further, we prove some convergence theorems for nonlinear mappings.

Keywords: Fixed point, attractive point, acute point, iteration, weak convergence, strong convergence

The author is supported by Grant-in-Aid for Scientific Research No. 26400196 from Japan Society for the Promotion of Science.
Browder’s Convergence Theorem in CAT(0) Spaces Endowed with Graph

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Abstract

In this talk, we discuss about CAT(0) spaces endowed with graph. The Browder’s convergence theorem for G-nonexpansive mappings will be presented. This results extend and generalize the result of Tiammee, Kaewkhao and Suantai (2015).

Keywords: CAT(0) space; directed graph; nonexpansive mapping; Browder’s convergence theorem

References:

TRIPLED PBVPS OF NONLINEAR SECOND ORDER DIFFERENTIAL EQUATIONS

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ABSTRACT

The present paper proposes a new monotone iteration principle for the existence as well as approximations of the tripled solutions for a tripled periodic boundary value problem of second order ordinary nonlinear differential equations. An algorithm for the tripled solutions is developed and it is shown that the sequences of successive approximations defined in a certain way converge monotonically to the tripled solutions of the related differential equations under some suitable hybrid conditions. A numerical example is also indicated to illustrate the abstract theory developed in the paper. We claim that the method as well as the results of this paper are new to literature on nonlinear analysis and applications.

KEYWORDS:
Extensions of almost-$F$ and $F$-Suzuki contractions with graph and some applications to fractional calculus

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ABSTRACT

In this paper, we introduce the two new concepts of an $\alpha$-type almost-$F$-contraction and an $\alpha$-type $F$-Suzuki contraction and prove some fixed point theorems for such mappings in a complete metric space. Some examples and an application to a nonlinear fractional differential equation are given to illustrate the usability of the new theory.

KEYWORDS: fixed point; almost-$F$-contraction; $F$-Suzuki contraction; nonlinear fractional differential equation

REFERENCES:


Common fixed point theorem for multi-valued weak contractive mappings in metric spaces with graphs

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Abstract

In this research, a new type of weak contractive multi-valued mappings in a complete metric space with a directed graph is introduced. A common fixed point theorem of those two multi-valued mappings is established under some appropriate conditions. Moreover, some example illustrating our main result is also given. The obtained result extend and generalize several fixed point results of multi-valued mappings in the literature.

Keywords: fixed point; directed graph; multi-valued mappings; graph weak contractive mappings

References:


The authors were supported by the Thailand Research Fund under the project RTA 5780007 and Chiang Mai University.
A note on continuity of solution set for vector equilibrium problems

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Abstract

In this note, we consider the parametric weak vector equilibrium problem. By using a weaker assumption in Peng and Chang (2014), the sufficient conditions for continuity of the solution mappings to a parametric weak vector equilibrium problem are established. Examples are provided to illustrate the essentialness of imposed assumptions. As an advantages of the results, we derive the continuity of solution mappings for vector optimization problems.

Keywords: equilibrium problem; solution mapping; continuity; linear scalarization

References:


Barrier method for convex optimization problem without regularity of constraint functions

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Abstract

We consider the convex optimization problem when the objective function may not smooth and the constraint set is represented by constraint functions that are locally Lipschitz and directionally differentiable, but neither necessarily concave nor continuously differentiable. The obtained results improve and extend those results that have been presented in [Dutta, J., Lalitha, C.S.: Optimality conditions in convex optimization revisited. Optim. Lett. 7(2),221-229 (2013)], and [Dutta, J.: Barrier method in nonsmooth convex optimization without convex representation. Optim. Lett. 9(6), 1177-1185 (2015)], by removing the regularity and continuously differentiable assumptions on the constraint functions from the considering.

Keywords: Convex optimization; log-barrier function; locally Lipschitz function; directionally differentiable; Clarke derivative; regular function.

References:

Fixed point theorems of a new set-valued MT-contraction in 
$b$-metric spaces endowed with graphs

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Abstract

In this work, we introduce a new concept of Set-Valued Mizoguchi-Takahashi G-contractions and prove some fixed point theorems for such mappings in $b$-metric spaces endowed with directed graphs. Our results improve and extend those of Mizoguchi, Takahashi [7] and Sultana, Vetrivel [19]. We also give some examples supporting our main results. As an applications, we prove the existence of fixed points for set-valued mappings satisfying generalized MT-contractive condition in $c$-chainable $b$-metric spaces.

Keywords: fixed point; Mizoguchi-Takahashi function; $b$-metric spaces; directed graph; set-valued map; $c$-chainable metric space.

References:


The authors were supported by the Thailand Research Fund under the project RTA5780007 and Chiang Mai University, Chiang Mai, Thailand.
Fixed point theorems for generalized fuzzy contractive mappings with altering distance in fuzzy metric spaces

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Abstract

The aim of this work is to introduce and prove the existence and uniqueness of fixed point for generalized fuzzy \((\alpha, \beta, \varphi)\)-contractive mappings in complete fuzzy metric spaces. The research is illustrated by example.

Keywords: \(\alpha\)-admissible; fixed point; fuzzy metric spaces, generalized fuzzy contractive mapping.

References:


The author was supported by Faculty of Liberal Arts, Rajamangala University of Technology Rattanakosin Research.
Flight re-timing models to improve the robustness of aircraft routings

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ABSTRACT

We study a problem on improving the robustness of aircraft routings. An aircraft routing is robust if the routings can minimize the effect of flight delays in day-to-day operations. We improve the robustness of old aircraft routings by re-timing departure time of flights. We derive optimization models to change departure time of flights while the feasibility of both aircraft and crew connections are maintained. We define several alternative objective functions to obtain the best distribution of optimal slacks that should be allocated to the connections. We construct a simulation for evaluating the robustness of the new routings. The computational results show that the re-timing flights can improve the robustness of aircraft routings significantly.

KEYWORDS: robust aircraft routing; slack; delay; re-timing flight

REFERENCES:

Fixed Point Theorems for Prešić almost contraction mappings in Orbitally Complete Metric Spaces Endowed with Directed Graphs

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Abstract

The main aim of this work is to introduce a class of generalized contractions in product spaces in the sense of Prešić. Some examples and fixed point theorems for such introduced mappings in the setting of orbitally complete metric spaces are discussed and provided.

Keywords: Prešić operator; almost contraction mapping; orbitally complete metric space; directed graph; fixed point

References:

The authors has been supported by Graduate School, Naresuan University and the Thailand Research Fund under the project RTA5780007.
Existence and convergence of fixed points for a strict pseudo-contraction in CAT(0) spaces

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Abstract

The purposes of this paper are to study some existence and convergence theorems of fixed points for a strict pseudo-contraction by using an iterative projection technique with some suitable conditions. The method permits us to obtain a strong convergence iteration for finding some fixed points of a strict pseudo-contraction in the framework of complete CAT(0) spaces.

Keywords: Strict pseudo-contraction; Iterative projection technique; CAT(0) spaces.

References:

On Locating-Chromatic Number of a Complete $n$-ary Tree of Depth 1, 2, and 3

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Abstract
The concept of locating-chromatic number of a graph was introduced by Chartrand, Erwin, Henning, Slater and Zhang in 2002. The locating-chromatic number of a graph is a special case of the graph partition dimension. The partition dimension of graph was introduced by Chartrand al. in 1998. The locating-chromatic number of trees was firstly studied by Chartrand et al. in 2002. Chartrand et al. determined the locating-chromatic of paths and double stars. Furthermore, Chartrand et al. also studied that for any integer, there exist a tree on vertices with the locating-chromatic number. Asmiati et al. determined the locating-chromatic number of firecrackers and amalgamation of stars.

Let $c$ be a $k$-coloring of graph $G(V,E)$ and $\Pi = \{C_1, C_2, \cdots, C_k\}$ be the partition of $V(G)$ induced by $c$, where $C_i$ is the set of all vertices receiving color $i$. The color code $c_\Pi(v)$ of a vertex $v \in V(G)$ is the ordered $k$-tuple $(d(v,C_1), d(v,C_2), \cdots, d(v,C_k))$, where $d(v,C_i) = \min\{d(v,x) | x \in C_i\}$ and $d(v,C_i) < \infty$ for all $i \in [1,k]$. If all vertices of $H$ have distinct color codes, then $c$ is called a locating-coloring of $G$. The locating-chromatic number of $G$, denoted by $\chi_L(G)$, is the smallest $k$ such that $G$ admits a locating-coloring with $k$ colors. Let $T(n,k)$ be a complete $n$-ary tree, namely a rooted tree with depth $k$, which each vertex has $n$ children, except for its the leaves. In this paper, we determine the locating-chromatic number of complete $n$-ary tree $T(n,k)$ with $k = 1, 2, \text{ and } 3$.

Keywords: color code, locating-chromatic number, complete $n$-ary tree

References:
An iterative process for a hybrid pair of generalized $I$-asymptotically nonexpansive single-valued mapping and generalized nonexpansive multi-valued mappings in Banach spaces

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ABSTRACT

In this paper, we establish an iterative process for approximating a common fixed point for a hybrid pair of generalized $I$-asymptotically nonexpansive single-valued mappings and generalized nonexpansive multi-valued mappings. The weak convergence theorems and strong convergence theorems of the proposed iterative process in Banach spaces are proven. Our results improve and extend several results in the existing literature.

KEYWORDS: generalized $I$-asymptotically nonexpansive mappings; generalized nonexpansive multi-valued mappings; Banach spaces; common fixed points
Viscosity approximation method for split common null point problems between Banach spaces and Hilbert spaces

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Abstract

We study an iterative scheme to approximation the split common null point problems for set-valued maximal monotone operators which combine viscosity method and some fixed point technically proving method between Banach spaces and Hilbert space, without using the metric projection. We prove that strong convergence theorem. Also, we show that our result can be solves the split minimization problems.

Keywords: iterative method, viscosity approximation method, fixed point problems, split common null point problems, a zero point, nonexpansive operator, (metric) resolvent operator.

References:


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ABSTRACT

Differential Evolution Algorithm (DEA) is one heuristic numerical methods used to find the location an extreme point on multivariable function both linear or non linear. Generally, DEA need random point population that are repeated several times. But these are only taken from random point uniformly distributed. In this paper, the distribution point not only used random but also non random or systematic. There are point fulfill area, formed lines, or follow a specific function. Each population are compared in accuracy and the number of iterations required. The accuracy is calculated based on the value of objective function. Spread different point aimed to examine the effect of the initial value of the DEA convergence towards a solution. The results obtained showed that the DEA is quite powerful method to find a locate of maximum or minimum value from a function multivariable. Here, the method is used on a case study of inverse problem of a Markov model. Problem on that topic is to estimate a transition matrix in a Markov model. Inverse problem will transform matrix transition problem into the optimization problem of function of two variables. So, the DEA is used to solve that problem.

KEYWORDS: Differential Evolution Algorithm; random point distribution; non-random point distribution; objective function value; inverse problem
The resolvent operator techniques with perturbations for finding zeros of maximal monotone operator and fixed point problems in Hilbert spaces

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\textbf{Abstract}

In this paper, we introduce iterative schemes with perturbations for finding zeros point of the sum of two monotone operators and a fixed point problem of a nonexpansive mapping in Hilbert spaces. We prove a strong convergence theorem of the proposed iterative schemes under appropriate conditions. Furthermore, we also apply our results to solving the variational inequality and equilibrium problems.

\textbf{Keywords:} strong convergence; iterative method; monotone operators; fixed point; variational inequality

\textbf{References:}


The Borwein-Preiss variational principle for nonconvex countable systems of equilibrium problems

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ABSTRACT

The aim of the present paper, by using the Borwein-Preiss variational principle, we prove existence results for countable systems of equilibrium problems. We establish some sufficient conditions which can guarantee two existence theorems for countable systems of equilibrium problems on closed subsets of complete metric spaces and on weakly compact subsets of real Banach spaces, respectively.

KEYWORDS: Borwein-Preiss variational principle, bifunction, complete metric space, equilibrium problems, gauge-type function, nonconvex.

REFERENCES:


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FIXED POINTS AND PERIODIC POINTS OF $\alpha$-TYPE $F$-CONTRACTION MAPPINGS

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Abstract

In this paper, we introduce new concepts of $\alpha$-type $F$-contractive mappings which are essentially weaker than the class of $F$-contractive mappings given in [D. Wardowski, Fixed Point Theory and Applications 2012 2012:94 and D. Wardowski, N. Van Dung, Demonstratio Math, 2014, 47: 146â–‡155] and different from $\alpha$-GF-contractions given in [N. Hussain, P. Salimi, Taiwanese J Math, 2014, 18: 1879-1895]. Then, sufficient conditions for the existence and uniqueness of fixed point are established for these new types of contractive mappings, in the setting of complete metric space. Consequently, the obtained results encompass various generalizations of the Banach contraction principle.

Keywords: $\alpha$-type $F$-contractive mappings.

References:
A Generalization of Ekeland’s $\varepsilon$-Variational Principle for $\tau$-distance

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ABSTRACT

In this paper, we present the Cantor Intersection Theorem for $\tau$-distance and the generalization of Ekeland’s $\varepsilon$-Variational Principle. Our results in this paper extend and improve some known results in the literature.

KEYWORDS: The Ekeland’s $\varepsilon$-Variational Principle; Borwein-Preiss smooth variant; $\tau$-distance

REFERENCES:


The authors were supported by the Higher Education Research Promotion and National Research University Project of Thailand, Office of the Higher Education Commission (NRU-CSEC No.55000613).
Impulsive Quantum Difference Equations

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Abstract

Quantum difference equations has been introduced in 1910 by Jackson [H.F. Jackson, q-Difference equations, Am. J. Math. 32, (1910) 305-314.] In this presentation, we give some new concepts of ordinary and fractional of quantum calculus which can be used for constructing impulsive quantum difference equations. The initial and boundary value problems of impulsive quantum difference equations are shown.

Keywords: quantum derivatives; quantum integrals; impulsive quantum difference equations

References:

On penalty method for lexicographic vector equilibrium problems

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Abstract

We consider vector equilibrium problems involving lexicographic cone. A penalty function method for solving such problems is proposed. We prove that every solution of the original lexicographic equilibrium problem is a cluster point of the penalty trajectory of the penalized problem. Using the regularized gap function to obtain an error bound result for such penalized problems is given.

Keywords: Lexicographic cone; equilibrium problem; penalty method; gap function; error bound
Adaptive optimal control for a bilinear model in cancer chemotherapy

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Abstract

The cell cycle in cancer chemotherapy is modelled in a bilinear system which are linear in the states and inputs but not linear in both. The policy iteration (PI) is used to solve the optimal control problem of the bilinear system. The PI is an online control method which does not require the internal system dynamic and avoids the direct solution of the HJB equation. The simulation results for adaptive optimal control design enables the researchers to know the effects of the chemotherapy and the number of cancer cells during treatment.

Keywords: bilinear system; cycle-cells; cancer chemotherapy; adaptive optimal control; policy iteration

References:


The authors were supported by Ministry of Education, Research and Technology of Indonesia via BOPTN.
Positive solutions for hybrid fractional $q$-difference equations

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ABSTRACT

In this talk, we present some new existence results for positive solutions for hybrid fractional $q$-difference equations. By using the hybrid fixed point of two operators, the main theorem is proved. An example will be illustrated in the last sections.

KEYWORDS: positive solutions; fractional $q$-difference equations; fixed point theorem

REFERENCES:

Design Linear State Feedback Controller for Bilinear System using Hybrid Genetic Algorithm - Particles Swarm Optimization

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Abstract

In this paper the bilinear system, \( \dot{x}(t) = Ax(t) + Bu(t) + N(x(t), u(t)) \) is a system with linear on state variables (\( x(t) \) variable) and linear on input variables (\( u(t) \) variable) but not both. With \( N(x(t), u(t)) \) as a function state and input. We would like to create a controller \( K \) such that the linear state feedback \( u(t) = Kx(t) \) make the bilinear system more stabilize than before. We join Genetic Algorithm and Particles Swarm Optimization as a hybrid algorithm. In here we design the matrix \( K \) using a hybrid algorithm.

Keywords: Linear State Feedback Controller; Bilinear System; Hybrid Algorithm; Genetic Algorithm; Particle Swarm Optimization

References:

[3] Li, Zhijie, Xiangdong Liu, Xiaodong Duan, dan Feixue Huang, "Comparative Research on Particle Swarm Optimization and Genetic Algorithm", *Computer and Information Science* Volume 3 No. 1, February, 2010

The authors were supported by Negara Kesatuan Republik Indonesia
Sequential Optimality Conditions for Generalized Equilibrium Problems involving DC functions

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ABSTRACT

We consider a generalized equilibrium problem involving DC functions which is called (GEP). For this problem in the absence of any constraint qualifications we establish two new sequential Lagrange multiplier rule conditions characterizing optimality for (GEP). The first one is condition in terms of the epigraphs of conjugate functions. The second sequential condition characterizing in terms of the subdifferentials of the functions involved at the minimizer. The significance of the results yield the standard Lagrange multiplier rule condition for (GEP) under simple closedness condition and new proposed approach.

KEYWORDS: equilibrium; DC functions; constraint qualifications; Lagrange multiplier
Supremacy of fixed point theory and its applications

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Abstract

Fixed point theory handles many areas of mathematics, such as general topology, algebraic topology, nonlinear functional analysis and ordinary and partial differential equations and also serves as a useful tool in applied mathematics. Fixed point theory is a powerful device to determine uniqueness of solutions to dynamical systems and is widely used in theoretical and applied analysis. In my talk, I will emphasis on the consistency and the balance of theory and applications of fixed point theorems in various abstract spaces which highlights that now a days, fixed point theory is not only a branch of pure mathematics but of applied mathematics also. In this concern, I bring to light on some recent papers [Applied Mathematics and Computation, 273 (2016), pp. 155-164, Applied Mathematics and Computation, 268 (2015), pp. 839-843, Journal of Inequalities and Applications (2015), 2015:32]. Furthermore, recognizing aforementioned paper, my talk is focused on applications of fixed point theorems relating some Boundary value problems, Dynamic programming Problems and Integral equations arising in Science and Engineering like solution of beam equation, solution of Besselâ€™s type equations etc., which highlight the superiority of fixed point theorems and its applications.
Stability for parametric primal and dual equilibrium problems

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\textbf{ABSTRACT}

We study the parametric primal and dual equilibrium problems in locally convex Hausdorff topological vector spaces. Sufficient conditions for the approximate solution maps to be Hausdorff continuous are established. Based on scalarization method, we also discuss the Hausdorff continuity of the approximate solution maps of parametric weak vector equilibrium problems. As applications, we derive the Hausdorff continuity of the approximate solutions maps for optimization problems and variational inequalities.
SOME CONVERGENCE RESULTS FOR SKC MAPPINGS IN HYPERBOLIC SPACES

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Abstract

All normed spaces and their subsets are the examples of convex metric spaces. One such convex structure is hyperbolic space which was introduced by Kohlenbach [U. Kohlenbach: Some logical metatheorems with applications in functional analysis, Trans. Amer. Math. Soc., vol. 357(2005), 89-128]. The aim of this paper is to prove some results on strong and $\Delta$-convergence of S-iterative scheme for SKC mappings in hyperbolic spaces. The results presented here extend and improve the results of Nanjaras et. al. [B. Nanjaras, B. Panyanak, W. Phuengrattana, Fixed point theorems and convergence theorems for Suzuki generalized nonexpansive mappings in CAT(0) spaces, Nonlinear Analysis:Hybrid Systems, Vol. 4(2010), 25-31], Karapinar and Tas [E. Karapinar and Kenan Tas, Generalized (C)-conditions and related fixed point theorems, Computers and Mathematics with Applications, Vol. 61(2011), 3370-3380].
An iterative approximation scheme for solving a split generalized equilibrium, variational inequalities and fixed point problems

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**Abstract**

In Indonesia, the case of toxoplasmosis in humans ranges between 43-88% whereas in animals ranges from 6 to 70%. Toxoplasmosis is a disease caused by *Toxoplasma gondii* is a parasite disease and on animals that can be transmitted to humans. The purpose of this research is to know the mathematical model and the analysis of the stability of models on propagation of the parasite of *Toxoplasma gondii* from the cat to congenital infection of the pregnant mother impact on the fetus through the placenta with herbal therapy as the treatment. This type of research using this type of research is the development by performing studies on the literature of books, reference, national and international scientific journals. This paper is developed from a mathematical Journal of ELSEVIER with authors from Venezuela, Colombia and Spain University.

**Keywords:** cat, pregnant mother; stability analysis; toxoplasma gondii

**References:**


Existence and uniqueness of coupled best proximity in complex valued metric spaces

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Abstract

In this paper, we prove the existence and uniqueness of a coupled best proximity point for mappings by using P-property in a complete complex valued metric spaces which is a recently introduced extension of metric spaces obtained by allowing the metric function to assume values from field of complex numbers. Further, our results are illustrated with examples.

Keywords: coupled best proximity; complex valued metric spaces; coupled fixed point

References:


Anti-Disturbance Inverse Optimal Control for Spacecraft Position and Attitude Maneuvers with Input Saturation

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ABSTRACT

In this paper, a new anti-disturbance inverse optimal translation and rotation control scheme for a rigid spacecraft with external disturbances and actuator constraint is presented. An inverse optimal controller with input saturations is designed to achieve asymptotic convergence to the desired translation and attitude and avoid the unwinding phenomenon. The derived optimal control law can minimize a given cost functional and guarantee the stability of the closed-loop system. Later, a new sliding mode disturbance observer is also proposed to compensate for the total disturbances. A rigorous Lyapunov analysis is employed to ensure the finite-time convergence of observer error dynamics. A numerical simulation of position and attitude maneuvers is given to verify the performance of the developed controller.

KEYWORDS: Translation and rotation control; input saturation; disturbance observer; inverse optimal control

REFERENCES:


The research was supported by King Mongkut’s University of Technology North Bangkok (KMUTNB) and Thailand Research Fund (TRF) [Contract number TRG5780030].
An iterative approximation scheme for solving a split generalized equilibrium, variational inequalities and fixed point problems

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Abstract

In this paper, we introduce a new iterative method for finding a common element of the set of solutions of the split generalized equilibrium problem, the set of the variational inequality for $\beta$-inverse strongly monotone mapping, and the set of fixed point of nonexpansive mapping in Hilbert spaces. We show that the sequence converges strongly to a common element of the above three sets under some controlling conditions. Moreover, the numerical examples are presented.

Keywords: Fixed point; Variational inequality; Viscosity approximation method; Nonexpansive mapping; Split generalized equilibrium problem
A new hybrid iterative algorithm for numerical reckoning fixed points of Suzuki’s generalized nonexpansive mappings

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Abstract

The purpose of this talk is to propose a new hybrid iterative algorithm to approximate fixed point of Suzuki’s generalized nonexpansive mappings. We prove some weak and strong convergence theorems in uniformly convex Banach spaces. A numerical example is also given to examine the fastness of the proposed iteration process under different control conditions and initial points with the well-known iterations such as Picard’s iteration, Mann’s iteration [4], Ishikawa’s iteration [3], Noor’s iteration [5] and the recent iterations of Agarwal et al. [2], Abbas et al. [1] and Thakur et al. [6].

Keywords: Fixed points; Suzuki’s generalized nonexpansive mappings; Uniformly convex Banach spaces.

References:


The authors were supported by the Thailand Research Fund and Thammasat University under Grant No. TRG5780013.
An Explicit Method to Solve Fuzzy Heat Equation with Integral Boundary Conditions

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Abstract

In this paper, we provide an explicit method to solve fuzzy heat equation with nonlocal boundary value conditions. We first express the necessary materials and definitions, then we consider a difference scheme for one dimensional heat equation. Here, boundary conditions include integral equations which are approximated by the composite trapezoid rule. In the last part, we give an example to check numerical results. In this example, we obtain the Hausdorff distance between exact solution and approximate solution.

Keywords: Explicit method; Fuzzy numbers; Fuzzy heat equation; Finite difference scheme

References:

On the qualitative properties for solutions equilibrium problem involving Lorentz cone

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\textbf{Abstract}

In this work, inspired by the great importance of equilibrium problems and the Lorentz cone, we consider the equilibrium problem involving Lorentz cone in $\mathbb{R}^n$. Sufficient conditions for the solution maps to such problems to be upper semicontinuous, lower semicontinuous, closed and well-posed are established. We provide numerous examples to explain that all the imposed assumptions are essential. Applications the achieved results to the variational inequality are also discussed.

\textbf{Keywords}: Lorentz cone, well-posedness, upper semicontinuity, lower semicontinuity, existence of solution maps, equilibrium problem, variational inequalities

\textbf{References}:

On Vector Optimization Problems and Vector Variational Inequalities via Convexificators

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Abstract

We discuss some results which exhibit an application of convexificators in vector optimization problems and vector variational inequalities involving locally Lipschitz functions. We present vector variational inequalities of Stampacchia and Minty type in terms of convexificators and use these vector variational inequalities as a tool to find out necessary and sufficient conditions for a point to be a vector minimal point of the vector optimization problem. We also discuss the corresponding weak versions of the vector variational inequalities and several results to find out weak vector minimal points.
Index

Abbas, M., 107
Adhikari, A., 64
Aghayan, S.M., 120
Aiemsomboon, L., 56
Akbar, A., 87
Ali, J., 30
Anakkamatee, W., 90
Anh, L.Q., 19, 60, 110, 116, 125
Anorat, K., 63
Ansari, Q.H., 7
Aphithana, A., 112
Arunchai, A., 108
Atsushiba, S., 89
Bantaojai, 60
Baskoro, E.T., 101
Boonman, P., 84
Boriwan, P., 99
Budhia, L., 92
Buranakorn, K., 76
Chaipornjareansri, S., 45
Chaipunya, P., 40
Cho, Y.J., 4, 24, 34, 38, 46, 71, 96
Cholamjiak, P., 34
Chuasuk, P., 102
Chuensupantharat, N., 51
Chugh, R., 118
Danh, N.H., 125
de Lara, M., 15
Deepho, J., 35, 122
Dhompongsa, S., 3
Dien, H.T.H., 36
Dong, Q.-L., 71
Duy, T.Q., 60, 110
Fajar, R., 119
Farajzadeh, A., 18
Farajzadeh, A.P., 39
Ghimire, R.P., 64
Gopal, D., 16, 57, 92, 107
Gupta, A., 91
Hadianti, R., 98
Han, S.-E., 117
Hosseinpour, A., 124
Hunwisai, D., 25
Huy, L.M., 125
Indratno, S.W., 104
Jain, D., 57
Jha, K., 55, 58, 65
Jitpeera, T., 63
Joelianto, E., 111
Kaewcharoen, A., 102
Kangtunyakarn, A., 69, 70
Kaskasem, P., 79
Khammahawong, K., 43
Khanh, P.Q., 5, 36
Khantrie, C., 20, 114
Khaofong, C., 26
Khotimah, N., 119
Khuangsaung, W., 70
Kim, J.K., 13
Kim, Y.-H., 62
Kimura, Y., 14
Klin-eam, C., 77, 79
Kohsaka, F., 21
Komai, S., 41
Kongban, C., 42
Kruger, A., 12
Kumam, P., 24–28, 33, 35, 38, 40–43, 46, 50–53, 57, 63, 66, 82, 92, 103, 105, 122
Kumrod, P., 47
Kurniastuti, N.I., 119
Lee, G.M., 6
Lee, J.H., 6
Lestari, D., 119
Liani, V., 119
Linh, T.T.K., 125
Lisnawati, I., 119
Mahardhika, T., 113
Manandhar, K.B., 55
Manro, S., 91
Martínez-Moreno, J., 35, 122
Mehmood, N., 87
Mishra, S. K., 126
Mongkolkeha, C., 38
Muangchoo-in, K., 52
Munkong, J., 72
Naiborhu, J., 111
Nanjaras, B., 31
Nantadilok, J., 49
Ngeonkam, B., 80
Nimana, N., 39
Novianingsih, K., 98
Ogata, Y., 6
Onsod, W., 50
Oyjinda, P., 73
Pluciennik, R., 10
Padcharoen, A., 46, 57
Pakkarananang, N., 53
Panthong, C., 33
Panyakan, B., 29
Pasaribu, U.S., 104
Patel, D.K., 107
Permana, D., 104
Petrot, N., 39, 68, 75, 95, 99
Phiangsungnoen, S., 97
Pholasa, N., 34
Phosri, P., 74
Puangphoo, P., 82
Pitea, A., 61
Piwma, N., 81
Plubtieng, S., 67, 76, 106, 108
Plubtieng, S., 12
Poohai, N., 73, 113
Pongpulpbonsak, A., 83
Preechasilp, P., 94
Promluang, K., 103
Promsinchai, P., 95
Pukdeboon, C., 121
Puripat, C., 83
Puturong, N., 100
Rajopadhyyaya, U., 58
Riyanto, T., 113
Rohen, Y., 88
Saejung, S., 17
Saipara, P., 24
Saito, Y., 6
Saksirikum, W., 75
Sammanit, K., 32
Saraghi, R., 113
Sarigih, R., 111
Sarikavaniwijit, T., 83
Simanjuntak, R., 101
Singh, D., 115
Sintunavarat, W., 47, 48, 54, 56, 123
Sirichunwuijit, T., 86
Sisarat, N., 85
Sitthithakerngkiet, K., 35, 122
Solikhah, 111
Sombat, A., 66
Sridarat, P., 93
Suanoom, C., 77
Suantai, S., 11, 93, 99
Suantai, S., 96
Sukprasert, P., 28
Sumalai, P., 27, 33
Sunnhrayuth, P., 105
Suprayogi, 104
Suwannaut, S., 69
Takahashi, W., 2
Tam, T.N., 116
Tanaka, T., 6
Tangkhawiwetkul, J., 68
Tariboon, J., 109, 112
Thainwan, T., 81
Thamboonruang, N., 49
Tiammee, J., 96
Tomar, A., 44
Tongnoi, B., 90
Uddin, I., 30
Unghittrakool, K., 59, 72, 78, 80, 100
Uttunggadewa, S., 101
Vetro, C., 107
Vai, P.T., 19, 60
Wangkeeree, R., 20, 60, 84–86, 94, 114
Welyyanti, D., 101
Yamaod, O., 54
Yuan, H.-B., 71
Yuying, T., 67
Zireh, A., 120